UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
IN SEATTLE

UNITED STATES OF AMERICA, et al,	)	
	)	
Plaintiffs,	)	No. C70-9213
	)	Subproceeding 01-1
v.	)	
	)	FINAL
STATE OF WASHINGTON, et al.,	)	
	)	
Defendants.	)	
	)	

TRANSCRIPT OF PROCEEDINGS

BEFORE THE HONORABLE RICARDO S. MARTINEZ

October 20, 2009

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THE COURT: Counsel, welcome back to our session. Had we finished with this witness?

MS. WOODS: Your Honor, we have a few more questions for Mr. Barber. We've also reached agreement on a few exhibits, and we can take care of that right away.

THE COURT: Great.

MR. MONSON: Good morning, your Honor. Peter Monson for the United States.

The United States has proposed Exhibit USA 197 for admission, and the State had objected to that. We have, I believe, resolved that objection by adding several pages to the document, Pages 7 through 42. And we have provided Madam Clerk with two copies of the substitute exhibit to just incorporate and replace the one that's in the Court's binders.

THE COURT: My understanding, Ms. Woods, as substituted now, the State has no objection to what is now USA 197?

MS. WOODS: That is correct, your Honor.

THE COURT: Then 197 will be admitted.

MR. MONSON: Thank you, your Honor.

THE COURT: Madam Clerk, you have a copy of this?

THE CLERK: I do.

MS. WOODS: There are also several tribal exhibits that we've reached agreement on.

THE COURT: All right. Thank you.

MS. WOODS: The first one is AT-194. I believe the

situation there is similar to the one that Mr. Monson described with USA 197. Some material has been added that has enabled the State to withdraw its objection.

THE COURT: All right. So as presently constituted, then the State has no objection to AT-194?

MS. WOODS: That is correct.

THE COURT: AT-194 will be admitted.

MS. WOODS: The next one is AT-216. That's one of the exhibits that Ms. Rasmussen introduced yesterday, and we waited until today to decide what to do about it. The State has no objection to AT-216.

THE COURT: AT-216 will also be admitted.

MS. WOODS: The next one is AT-250. The State has no objection to AT-250.

THE COURT: That's the deposition? It's a spreadsheet.

MR. FERESTER: It's a spreadsheet.

THE COURT: Spreadsheet, okay. AT-250 will be admitted.

MS. WOODS: Finally, AT-319. AT-319 is one of the exhibits that Ms. Rasmussen displayed yesterday. The State has no objection to AT-319.

THE COURT: That is the one that is authored by Pat Powers.

MS. WOODS: That's correct.

THE COURT: All right. AT-319 will be admitted. Thank you, Ms. Woods.

MS. WOODS: Thank you.

And I'm ready to continue the redirect examination of Mr. Barber.

THE COURT: All right. Give me one moment. I have a question about an exhibit that was brought up by Ms. Rasmussen yesterday in her questioning I think of this witness, and that's AT-236. That's the summary of the passage -- Fish Passage Inventory and Correction Status.

Ms. Rasmussen, have you decided not to offer that or have you reached an agreement on that one?

MS. RASMUSSEN: No, we've not reached agreement. It is my understanding Ms. Woods will be asking additional questions and then we will be dealing with that particular issue.

THE COURT: Thank you. All right.

Ms. Woods, you may inquire.

(Continued Redirect Examination)

By Ms. Woods:

Q Mr. Barber, yesterday the Court asked you a question about whether the Washington Department of Fish and Wildlife had a definition of "culvert failure," and I believe you answered that question in terms of whether a culvert could pass fish; is that right?

A That's correct.

Q Are there any other ways that the term "culvert failure" is used?

A **Yes. And I realized after court yesterday that we discussed Barns Creek, and I think we referred to Barns Creek as a failure. In that case, it was a physical or structural failure of the culvert. And in that case what was happening is the culvert near the downstream end of the culvert was collapsing, causing the road shoulder to slump into the creek. The shoulder was gone up to the right-hand lane of southbound I-5, causing the Washington Department of Transportation to close the right lane for public safety.**

If they hadn't addressed the issue to replace the culvert or somehow remediate the failure, they could have lost the entire southbound lanes of I-5. So that's another way culverts can fail, more catastrophically.

Q **Mr. Barber, yesterday Ms. Rasmussen asked you some questions about what has now been admitted as Exhibit AT-156. I would like to ask a few more questions about it. I have displayed the first page of AT-156 on the screen.**

What is the date on AT-156?

A **April 8th, 1997.**

Q **As of that time, how many WSDOT fish passage barrier culverts had been identified, as far as you know?**

A **In the 1997 progress report, there was 509 total known fish passage barriers identified.**

Q **What did that number include?**

A **It included 268 culverts that had a significant habitat gain,**

at least 200 meters of upstream and downstream habitat. That inventory only went up to the 7 percent stream gradient because the original DOT inventory only took into account fish passage for salmon.

After the merger, it was recognized that we needed to account for barriers for Steelhead as well -- with the merger of the Department of Fisheries and the Department of Fish and Wildlife. I should clarify.

So what happened then was the Department of Fish and Wildlife sent crews back to several WRIAs throughout the state to try to come up with an estimate of how many additional barriers there were in the state in that 7 to 12 percent stream gradient that would account for barriers to Steelhead.

Through that process, it was estimated that there would be an additional 95 barriers statewide. So the total known in 1997 with a significant habitat gain would have been 363.

Q What type of fish passage barrier corrections was WSDOT performing in the mid 1990s?

A Primarily fishway retrofits.

Q In your opinion, is it reasonable to rely on Exhibit AT-156 to determine the scope of the fish passage barrier problem today?

MS. RASMUSSEN: Objection. That calls for a legal conclusion.

THE COURT: Overruled.

You may answer.

THE WITNESS: No, I don't.

By Ms. Woods:

Q In your opinion, is it reasonable to rely on Exhibit AT-156 to determine the types of fish passage barrier correction projects that are being conducted today?

A No, I don't.

Q In your opinion, is it reasonable to rely on Exhibit AT-156 to determine the cost of fish passage barrier correction projects today?

A No, I do not.

Q In your opinion, is it reasonable to rely on Exhibit AT-156 to determine the pace at which fish passage barrier correction projects should be conducted today?

A No, I don't.

Q When we began this inquiry this morning, the Court had asked some questions about Exhibit AT-236. I would also like to ask a few questions about that. I have it here displayed on the screen.

Mr. Barber, I believe you testified yesterday that you prepared some of the information that went into Exhibit AT-236?

A Yes, I did.

Q Why did you do that?

A It was an e-mail request from you to do so.

Q Do you know why I was asking for it?

A In preparation for this case.

Q **Did you create the information that went into Exhibit AT-236 as part of your normal job duties?**

A **Yes, I did.**

Q **Would you have created the information for an exhibit like this if I had not asked?**

A **Probably not.**

Q **Do you know who prepared Exhibit AT-236?**

A **Since you were the one that requested the information, I assume that you did.**

MS. WOODS: Thank you. That's all my questions.

MS. RASMUSSEN: Your Honor, I would like to recross on Exhibit AT-156, please.

THE COURT: Are you done, Ms. Woods? I'm not sure. Do you have other questions?

MS. WOODS: I am done. Thank you, your Honor.

THE COURT: All right. Ms. Rasmussen, regarding AT-236.

MS. RASMUSSEN: 156.

THE COURT: Don't say it unless you mean it, Counsel. One question.

THE CLERK: 156.

MS. RASMUSSEN: I really mean 156.

THE COURT: Oh, I'm sorry. I thought you said --

MS. RASMUSSEN: To recross on the briefing document fish passage because yesterday I didn't ask any questions other than to identify the document. And Ms. Woods has gone through and

asked if it's reasonable to rely on certain parts of the document. I'd like to know what he thinks about the -- if he thinks the document is acceptable.

Can you go ahead and put up 156?

THE COURT: You may proceed, Ms. Rasmussen.

RECROSS-EXAMINATION

By Ms. Rasmussen:

Q Mr. Barber, Ms. Woods asked you about numerous portions, including the cost estimate that was done in 1997 and the number of culverts and a couple of other items that she asked you if it was reasonable to rely on, and you said no.

Is that the extent of the parts of the document which are not reasonable to rely on?

A I think there are other components of it that could be questionable.

Q Is it questionable, the statement in the first paragraph, that "Fish need habitat, but if they cannot reach spawning and rearing areas, then the full potential of the habitat is not achieved and depressed, and even healthy fish stocks decline to levels that cannot support utilization objectives and even levels of extinction"?

A I think that statement's correct.

Q And No. 2, that state law requires fish passage, is that no longer correct?

A No, that is still correct.

Q **And you didn't state any opinion about the miles of road crossings that were estimated, did you?**

A **No, I didn't.**

Q **Is it still true there is a need to accelerate fish passage corrections?**

A **I believe so.**

MS. RASMUSSEN: No further questions. Thank you.

THE COURT: I believe you may step down. Thank you.

THE WITNESS: Thank you.

THE COURT: Do we have a new witness?

MS. RASMUSSEN: Your Honor, I believe we have to deal with the rest of the objection back-and-forth of Ms. Woods and I on AT-236.

THE COURT: Let's deal with AT-236. That's the Fish Passage Inventory and Corrections Status Summary.

MS. WOODS: Your Honor, we maintain the objection to that document. As indicated in Mr. Barber's answer, that document was prepared for litigation. It was not prepared by an agency employee within the scope of his normal duties. It was prepared for litigation.

THE COURT: Ms. Rasmussen?

MS. RASMUSSEN: Yes, your Honor. This is essentially the quintessential admission. They created something and now they no longer like what they created, and so they want to take it back. But under the -- it's not hearsay under 802 (d)(2)(b)

if a party has manifested an adoption or belief in its truth.

And this document we asked about in recent discovery requests, which, again, under Rule 11, by signing a discovery response, the attorney certifies that to the best of a person's knowledge that the factual contentions have evidentiary support.

And I'm going to actually ask to approach, because I'd like to put up the request.

THE COURT: Please.

MS. RASMUSSEN: For the record, the interrogatory response is AT-308. In Interrogatory No. 13, it says, "Does the State contend that any of the amounts of spending per barrier culvert correction in Exhibit W-220" - and I will assert that it used to be W-220 and it's now AT-236 - "or the methodology used to prepare any of those figures are in any way inaccurate, unreliable, misleading, or not reflective of the complete costs of correction? Please state the reasons for your contention and what the correct figures are."

It says, "No. Proposed Exhibit W-220 was prepared two years ago in the spring of 2007, and the figures are out of date. But with respect to the particular agencies, the WDFW corrected their amount to 230," which is the amount depicted in Mr. Barber's current declaration. The Department of Fish and Wildlife noted the answer was prepared two years ago by John Peterson. And so for the very minimum as evidence of what the cost -- the assertion of the costs were two years ago, historically this

document can be used.

In addition, there's numerous case law in support that when offered against the parties answers, answers to interrogatories are admissions of a party opponent admissible for any purpose under 801(d)(2). The case that supports that is Victory Carriers, Inc., versus Stockton Stevedoring Co., 388 F.2d 955, Ninth Circuit, 1968.

THE COURT: That's fine, Ms. Rasmussen. I'm satisfied that there's sufficient legal basis to admit AT-236. The objection by the State will be overruled. Obviously what weight to give it is a different matter.

Does that take care of all the exhibits that you brought up yesterday?

MS. RASMUSSEN: Yes, it does.

THE COURT: All right. Thank you.

Now, do we have another witness?

MR. FERESTER: We do, your Honor. Before we get going, your Honor, my name is Phil Ferester for the State of Washington.

We're going to be working with Exhibit 094 and the attachments to that. I think we've resolved with the United States objections to two of the attachments, and I'd just like to clarify that at this time. Those would be attached as 094-B and 094-F.

MR. MONSON: That's correct, your Honor. The United States is withdrawing its objections to those two exhibits.

THE COURT: Mr. Ferester, what I show right now is that 094 -- W-094-B and F, as in Frank, have not been admitted. The rest of those exhibits have. Of course we have still not admitted W-094, the actual declaration.

MR. FERESTER: Right. We'll get to that in just a second.

THE COURT: All right. 094-B and W-094-F are now admitted.

MR. FERESTER: Thank you, your Honor. And the State will call Alex Nagygyor to the stand.

THE COURT: Good morning. I'll ask you to raise your right hand and be sworn.

Whereupon,

ALEX NAGYGYOR

Called as a witness, having been first duly sworn, was examined and testified as follows:

THE CLERK: Please state your full name and spell your last name for the court reporter.

THE WITNESS: Alex Nagygyor, N-A-G-Y-G-Y-O-R.

DIRECT EXAMINATION

By Mr. Ferester:

Q Good morning, Mr. Nagygyor. Where do you work?

A I work in Olympia, Washington, for the Department of Natural Resources.

Q And what position do you hold there?

A **I am the assistant division manager in the engineering division, and I manage the forest roads program.**

Q **And what are your responsibilities in that position?**

A **As assistant division manager, I am responsible for our culvert design team. I supervise that team. I also provide standards for our agency in forest road management and maintenance. I allocate out our budget to our regions and also supervise our forest roads public works.**

Q **How many people do you supervise?**

A **I supervise four people directly, and then there are 83 people in the forest road program within the Department of Natural Resources.**

Q **And are the rest of those people in regional DNR offices?**

A **Yes, they are.**

Q **How many road miles is the DNR responsible for?**

A **12,000.**

Q **How long have you worked for the Department of Natural Resources?**

A **For 23 years.**

Q **Can you discuss what prior positions you've held as an engineer?**

A **Yes. I started in the Olympic region on the Olympic Peninsula designing roads, doing road construction contracts, cost estimates. I did a similar job in our Chehalis office. I designed my first fish passage culvert while in the Chehalis**

office.

Then I was promoted to regional engineer, where I supervised a team of engineers and put together construction contracts and designs. I also supervised our road maintenance crew, our lands surveyor for the region, and the landscape planner.

Q And what is your educational background?

A I graduated from Oregon State University with a Bachelor of Science in School of Forestry, the Department of Forest Engineering.

Q And what year was that?

A That was 1985.

Q Are you a licensed engineer?

A Yes, I am.

Q What does it take to become a licensed engineer?

A A typical licensed engineer goes to college for four years. After they graduate, they sit for a fundamentals exam that lasts all day. Once they pass that exam, they are an engineer in training. They then work for a licensed engineer who reviews their work for four years, certifies that their work is satisfactory, and then they will sit for their PE, or Professional Engineering, exam. Once they have passed that exam, they become a professional engineer.

Q What does being licensed enable you to do?

A It enables me to bring a special set of skills to engineering problems, where I can design structures, design roads, do cost

estimates, put together specifications for contracts, and construction.

Q I think you have already mentioned that you have designed culverts for forest roads. Have you designed culverts using the stream simulation design method?

A Yes, I have.

Q How about culverts using the no-slope design method?

A Yes, I have.

Q Have you designed bridges as stream crossings?

A Yes.

Q Have you reviewed the culvert or bridge designs of other engineers that have worked for you?

A Yes.

Q How long have you been designing culverts for forest roads?

A I've been designing culverts for 21 years.

Q And during that time when you have designed culverts for forest roads, are those designs accomplished with the intent of forestry operations, in connection with forestry operations?

A Yes. They are designed for a forest road, typically a single-lane gravel surface.

Q Are you familiar with the State Forest Practices Act?

A Yes, I am.

Q How are you familiar with that?

A I have worked with the State Forest Practices Act since I started working with the agency 23 years ago.

Q **And are you familiar with the 2001 amendments to the Forest Practices Act called the Forests and Fish Law?**

A **Yes, I'm aware of that. That law has put additional requirements on our forest roads.**

MR. FERESTER: May I ask the clerk to please provide this witness Exhibit W-094, the amended declaration of Alex Nagygyor?

By Mr. Ferester:

Q **Can you please turn to Page 22 of your amended declaration?**

A **Yes.**

Q **Is that your signature?**

A **Yes.**

Q **And what is the date by your signature?**

A **29th of September 2009.**

Q **Did you prepare this declaration and the accompanying exhibits for this case?**

A **Yes.**

Q **Is this the written direct testimony that you intend to offer in this case?**

A **Yes, it is.**

Q **Do you adopt Exhibit W-094 and the accompanying Exhibits A through F as your direct testimony today?**

A **Yes.**

MR. FERESTER: The State offers Exhibit 094 and asks the Court to admit that, along with the accompanying exhibits.

I do note that there will be one objection from the tribes as to one specific portion of that declaration.

MR. GRUBER: Good morning, your Honor. We're playing a little musical chairs here. My name is Brian Gruber, and I'm an attorney for the Makah Tribe.

We listed in the pretrial order several objections to the various parts of the declaration. Our intent is to withdraw all of those with one exception, and that exception is to Paragraph 13, the first sentence, where Mr. Nagygyor offers an opinion regarding the degree of protection for fish that the Forest Practices Act offers.

And as he's testified here, his training and experience is entirely in forest engineering, not in habitat biology or fisheries biology. And as a result, we don't believe he's qualified as an expert to render an opinion on that subject.

THE COURT: I believe the sentence you object to says, "For reasons as follows, the regulatory standards in the State Forest Practices Act provide considerable protection for fish, particularly in the area of forest road management."

MR. GRUBER: That's correct.

MR. FERESTER: Your Honor, I believe we've already laid an appropriate foundation for this testimony. We didn't anticipate spending a lot of time on it this morning. But if you'd like additional background from this witness, we can certainly do that.

THE COURT: No, Counsel. I'm going to overrule the objection and admit the declaration in its entirety. I think the Court itself can determine for itself what exactly the Forest Practices Act provides. Thank you.

By Mr. Ferester:

Q Mr. Nagygyor, you mentioned that the Department of Natural Resources has 12,000 miles of forest roads.

Why do they have those roads?

A DNR constructs and maintains forest roads for the management of forest lands, specifically for the extraction of wood products.

Q And why do they -- why do they extract wood products?

A We extract wood products on state trust lands to provide a revenue to the trusts.

Q What are the trusts?

A The trusts are institutional organizations, such as the state universities, Washington State, University of Washington, penal institutions, and the county lands.

Q Does that include K through 12 schools, common schools?

A Yes, it does include common schools, K through 12.

Q Let's talk a little bit about DNR's barrier removal program. We will start with the inventory.

When did DNR start to inventory the culverts on its forest roads?

A We started our field inventory in 1999.

Q **And how was that inventory performed?**

A **It was performed as a road-based inventory where we collected information on maps, where roads were located, where streams were located. We then drove all of these roads and looked at those crossings and any other stream crossings for fish barrier culverts.**

Q **When was that inventory concluded?**

A **In April of 2001.**

Q **And was a report prepared at that time?**

A **Yes, there was.**

Q **With respect to the habitat associated with DNR's barrier culverts, how did DNR obtain habitat information to assist it with the prioritization process?**

A **Some habitat information was collected while they were at the specific streams. Other habitat information, such as habitat length, was generated from maps such as GIS data. And the information about fish species that might be in those streams was determined from other data sources.**

Q **Why did DNR use a different approach to obtaining habitat information when compared to WDFW or DOT?**

A **We determined early on that we had a lot of stream miles out there, and it would be too costly for us to do a stream-based habitat assessment, so we did a map-based habitat assessment.**

We also knew that we had a short timeframe to fix all these culverts. We thought it was prudent that we accomplish it in a

prompt manner.

Q What do you mean by "a short timeframe"?

A The fact that we were under a deadline of completing all our barriers by 2016.

Q Was that deadline part of the forests and fish amendments to the Forest Practices Act?

A Yes, it was.

Q As DNR has implemented its road maintenance and barrier removal programs, has it adjusted its inventory?

A Yes, we have.

Q Under what circumstances does DNR adjust the numbers in its inventory?

A Two different circumstances. We will remove barriers from our list when we determine that they are on lands that we no longer own. We also will remove barriers when we determine that we are not the agency responsible for the maintenance of those roads, such as county roads.

We will add barriers to our list when we trade in to or purchase new lands. And there has been situations where we added barriers to a list because we missed them during the field assessment, because they're typically in the brush, and we weren't able to find them with our first barrier assessment.

Q Have some barriers been removed from DNRs list because the stream was later determined not to contain fish?

A That's true.

Q **And do you adjust the inventory numbers after each repair season?**

A **Yes. Every winter we typically will maintain our database and add and subtract to that database.**

Q **And I mentioned repair season. Is there a particular repair season for fixing culverts?**

A **Our culverts are repaired in what we call the HPA window, which is typically July 1 to the end of September, during that construction season.**

Q **Have you prepared a short slideshow to provide an overview of DNR's road maintenance and barrier removal programs?**

A **Yes, I have.**

Q **Let's start with this. This first slide has a lot of words on it. Why don't you tell us what this demonstrates?**

A **This demonstrates the typical forest road that DNR manages here. And we are at a stream crossing where the road has -- is across a fish stream. And where the arrow is pointing, we have a culvert in that location that provides fish passage. We have also got some other structures out here that are minimizing the delivery of sediment to these waters. We have an inline sediment trap just above that arrow that catches the ditch-related sediment. We've also got a ditch relief culvert that catches the ditch water and allows that ditch water to be routed and then filtered through the forest floor.**

Q **And just to be clear, a ditch relief culvert is not one that**

is designed to pass fish that's not on a stream, is it?

A No. It's in a ditch.

Q This next slide discusses road abandonment. Can you describe what that is?

A Well, the DNR has the opportunity that when we assess our lands and our road maintenance strategies that we will evaluate some roads to be abandoned. And when we abandon a road with a fish barrier in it, we will remove the fill, we will remove the culvert and stabilize any of the associated other materials on that road. And it provides us another tool set that's fairly cost effective for us to remove fish barrier culverts.

Q In what circumstances are you able to abandon a forest road?

A We typically abandon forest roads when we determine that we no longer need them for management access, or they could be a redundant road or there could be a significant environmental impact associated with that road.

Q Turning now to the next slide, what does this show?

A This is a -- demonstrates a barrier on the upper left- hand picture.

And then on the lower right we have shown that we have corrected this barrier with a 15-foot metal arch that is sitting on concrete footings with a natural streambed designed and built underneath it.

Q I have just switched the slide again. What does this one show?

A **This shows the fact that we've taken an existing barrier, you can see it's pretty dramatic, with a couple foot outfall drop, and we replaced this with a concrete bridge.**

Q **When would a bridge type of replacement be used by DNR?**

A **We typically consider bridges on our larger streams that are bigger than 15 feet, also on streams that have steeper gradient and are larger than eight feet. We also need to consider what the alignment is associated with the road to make sure that we're not installing a very wide bridge.**

Q **And I have switched the slide again. What does this show?**

A **This shows that we are -- on the upper left, we are in the process of installing a stream simulation culvert. That is a picture of me doing some construction compliance inspection. And the contractor is in the process of installing the stream simulation rock within that culvert. They've got a person in there doing some manual labor, along with a bobcat loader that drives into the culvert and delivers rock into that structure.**

The picture on the lower right shows that structure that is half full with the rock and four years later still functioning fine.

Q **When DNR entertains one of these culvert repairs, does it need flaggers or other traffic detours on its road system?**

A **No, we don't. Forest roads are typically one lane, like I mentioned before. We will traditionally specify in the contract that our roads are allowed to be closed for two or three weeks.**

If needed, there is detours for recreation use that is provided. Or if we have some sort of hauling going on, they just schedule their hauling around our construction project.

Q I notice that this slide is a stream simulation culvert, and this next one here has some of the characteristics of that.

Do you want to briefly mention that?

A Yes. When you look at a stream simulation culvert, and it has been -- it is in the stream for a while, it has a couple of characteristics you can readily identify with the stream simulation culvert. It is going to have a low-flow channel that is outlined in red here. It is going to have some banks that you can see -- it has a small bank and a depositional area on the right side there. It has some riffle development. There's typically little pool development unless we've actually built in pools during the construction of that streambed material.

Q How long has DNR been using stream simulation designed culverts?

A We have been using them approximately since 2001.

Q How often does DNR use this design method?

A In the past previous years, it has exclusively been the design choice for the agency. We still use no-slope culverts out there. Those tend to be on contracts that we have had under contract for a number of years.

Q And as long as you mention no-slope culverts, let's look at the next slide.

What are we looking at here?

A This is a culvert that has been laid flat. It is installed in streams that are very small, typically small streams with flat gradients. The major characteristics when you can look at this culvert, right away you see there is water that is standing inside this culvert. There is not a bunch of riffles in the structure. It still allows sediment and water and fish to pass through this culvert. It is typically a little smaller culvert, and therefore for us a lower installation cost than stream simulation costs.

Q In your experience, how do these culverts handle storm events or flood flows?

A They handle the 100-year flood flows very well, just as well as the stream simulation culvert does.

Q In your experience, how do these culverts pass fish?

A They pass fish very well. You can physically look at the fact that there's standing water there, and the fish will migrate through that culvert.

Q I would like to turn now to some issues related to funding. How does DNR fund its culvert repair work?

A DNR funds its repair work through two primary methods: Through a contractual obligation associated with timber sales and through the Access Road Revolving Fund, abbreviated with the acronym ARRF.

Q We will talk about ARRF in a second. Let's talk about timber

sales. How does that process work?

A That contract obligation is put onto the purchaser of our sales, and they are obligated to do a certain amount of construction, reconstruction, and also fish barrier repairs.

Q How do timber purchasers account for those contractual burdens?

A Those burdens are taken off of their bid. They're going to determine what they want to bid for a sale, they're going to subtract out hauling costs, logging costs, any of their overhead in any of the construction or barrier replacement work, and that will be a reduction in funds to the trusts and to the agency's management account.

Q Approximately what percentage of DNR's barrier remediation projects have been accomplished through the timber sale process?

A In the past previous years, approximately 20 percent have been accomplished through timber sales.

Q And then let's turn to the other method DNR typically uses, the Access Road Revolving Fund, or ARRF. What is this, and for what purposes does DNR use the Access Road Revolving Fund?

A Access Road Revolving Fund is a fund specifically designated for road maintenance repairs. The funds for that account are associated with the selling of valuable forest products. A fee is calculated and collected during the date of sale, and then a fee is also collected when the timber is removed.

Q How long has DNR had the Access Road Revolving Fund account?

A **Since 1961.**

Q **And I think you mentioned that the source of funds come from timber sales?**

A **That's correct.**

Q **Are there any other fees that get added to the account as well for road use?**

A **There can be other associated minor fees collected for communication sites, for cost-share agreements, easements, that sort of thing.**

Q **Does the Washington State legislature need to appropriate funds from that account before DNR uses them?**

A **The ARRF account is a non-appropriated, budgeted account.**

Q **Whose responsibility is it to manage the account?**

A **Myself and the division of finance.**

Q **Mr. Nagygyor, has the ARRF account been running short of money in recent years?**

A **Back in 2001 we had a funding balance issue that resulted in us going below our minimum fund balance.**

Q **And how about in more recent years?**

A **In more recent years we have maintained the fund balance at the $3 million level or a little bit less. Most recently in the past couple of months, we have been able to get above that minimum fund balance.**

Q **In the last year, has the ARRF account been encountering shortages of money?**

A **Twelve months ago, that would have been true.**

Q **Is the level of ARRF account a concern from a road maintenance standpoint?**

A **Yes, it is. We determined that we had a short fund in the ARRF account. That short fund was a result of the fact that we weren't getting the amount of revenue into that account that we've seen in previous years. We had to adjust where we spent our money in that account and prioritize our projects.**

Q **Did you prepare a document regarding your concerns with the Access Road Revolving Fund balance?**

A **Yes, I have.**

MR. FERESTER: May I ask the clerk to please provide the witness Exhibit AT-131, entitled "ARRF Fee Increase Proposal."

By Mr. Ferester:

Q **Is this the memo that you wrote?**

A **Yes, it is.**

Q **And why did you write that memo?**

A **I wrote this memo because we determined that we were short in our Access Road Revolving Fund to meet our road maintenance and abandonment planning requirements by 2016 and identified that we had a funding issue, in that we needed to increase the ARRF fee to fund that gap.**

Q **Were you particularly candid in your memo?**

A **I tried to be.**

Q **Did any followup action occur on your memo?**

A **My supervisor and myself discussed the memo, and we -- he decided that it wasn't the appropriate time to forward this memo up to executive management.**

Q **And why is that?**

A **At that time in December, the agency was aware of the fact that it had a significant budget shortfall. We knew that we had to go through layoffs. We knew that if we were going to get an ARRF fee increase, that would be less money going to the trusts, that would be less money coming into our forest management accounts and would have the potential to increase the number of layoffs within the agency.**

Q **Was there discussion of some of the broader economic conditions at this time?**

A **Yeah. At that time we were not selling the typical amount of timber that we do on a monthly basis. Nobody was interested in our forest products because the amount of home construction was severely down, and we really had no idea when that market was going to turn around.**

Q **And is the home construction market, is that linked to demand for DNR timber?**

A **It is linked directly. Home construction requires lumber, and that lumber market really drives the price of our logs that we get at auction.**

Q **Let's talk about the numbers of culverts. Your declaration contains a lot of detailed information about DNR's inventory and**

how those numbers have changed across the years. Your testimony has covered some of this already.

On Page 18, did you include a summary chart in your declaration to help track those changes?

A Yes, I did.

Q Do the culvert numbers in your declaration pertain only to anadromous fish?

A They apply to both anadromous and resident fish, and they apply within the case area and then also within the entire state of Washington.

Q And why does DNR track its information that way?

A We track our information that way because we are required by WAC to replace all our resident and anadromous fish barriers within the state by 2016.

Q And when you say WAC, that is a state rule?

A Washington Administrative Code.

Q Is that under the Forest Practices Act?

A Yes, it is.

Q Has DNR determined how many anadromous barriers exist within the case area as of April 2009 when the rest of the culvert numbers in your declaration were created?

A Yes. We determined that we had 228 anadromous barriers within the case area.

Q And that's remaining?

A That's correct.

Q **How many barriers to resident or anadromous fish has DNR repaired since its inventory was completed on a statewide basis?**

A **We have removed, on a statewide basis, 744 fish barrier culverts.**

Q **And how about in the case area?**

A **Within the case area, there were 405 resident and anadromous fish barriers.**

Q **Given your experience with the DNRs funding problems with the Access Road Revolving Fund, the current market conditions for timber, and DNR's status on its barrier remediation program, do you think that you need an order from this Court to continue making progress towards fixing DNR's case area anadromous barriers?**

A **No.**

Q **Based on your experience, do you think DNR will be able to finish remediating all 228 of its anadromous case area barriers by July 2016?**

A **I believe that DNR has quite the task in front of it to get all the resident and anadromous fish barriers done by 2016. I believe that we can take our resources that we have identified for some of these resident barriers, some of these barriers outside the case area, and definitely fix all the anadromous barriers within the case area by 2016.**

MR. FERESTER: Thank you. I have no further questions at this time.

THE COURT: Mr. Gruber, before we get into cross-examination, let me ask him a clarifying question.

On the slideshow, we saw the stream simulation culvert and then we also saw the no-slope. How does your department make a determination, what process does it go through when it looks at a stream, small or not, and it says, we will go with no-slope here versus stream simulation?

THE WITNESS: It is really dependent upon the site conditions. The no-slope culverts work very well on low-gradient streams that are lower down in the watershed. Typically gradients around -- stream gradients are 1 to 2 percent. If you get 3 or 4 percent, you are immediately going to say no slopes aren't going to function very well.

We also use those on smaller streams because we don't want to install huge metal pipes in the ground. That can come with problems too. So no-slopes are traditionally low-gradient streams, lower in the water shed, they are smaller in nature.

They are at a lower cost, too. And that has been some of the driving force out there with folks. We are an agency that is supposed to make money for the trusts, so we are not supposed to be putting in structures that we don't think are above a certain level of threshold out there. No-slope culverts seem to be functioning very well in the situations that I have described.

THE COURT: And as part of this, is there a monitoring process that is ongoing?

THE WITNESS: We do not -- the agency does not have a defined monitoring program right now. We have worked with the Department of Fish and Wildlife, and me personally with Bob Barnard, to do a short-term, at this time, one-time monitoring program where we went out and monitored. And Bob Barnard went out there and evaluated a number of culverts to see how they were performing. So it provided us a monitoring service and then provided Bob the ability to generate some data for us that he was interested in completing.

THE COURT: Thank you.

You may inquire.

CROSS-EXAMINATION

By Mr. Gruber:

Q **Good morning, Mr. Nagygyor. How are you?**

A **Good, Brian.**

Q **You've been deposed in this case three times previously. Do you remember that?**

A **Yes.**

Q **I took your deposition twice earlier this year; is that right?**

A **Okay.**

Q **And by training, you are a forest engineer. Did I hear that correctly?**

A **That's correct.**

Q **And you earned a Bachelor of Science in forestry engineering?**

A **Yes.**

Q **And that degree involved no courses in fishery biology; is that correct?**

A **Correct.**

Q **And the only training you have had in culvert design and fish passage has been through short courses that you attended as a DNR employee; is that right?**

A **The culvert design, I got at university. The fish passage, design passage I received while as an employee of the Department of Natural Resources.**

Q **So you studied culvert design when you were in school in the early 1980s. Is that what you just said?**

A **That's correct.**

Q **And would it be fair to say that the science of culvert design has changed significantly since that time?**

A **It has changed in the fact that at university we were doing hydraulic design passage primarily of water, and after that we started to implement a passage of fish, the passage of wood, and the passage of sediment.**

Q **Those other considerations have been included since you earned your degree?**

A **That's correct.**

Q **And the short courses that you took regarding fish passage, were those courses taught by Bob Barnard and Ken Bates of WDFW?**

A **Yes.**

Q **And is it true that since 2006 you haven't taken any additional short courses on the subject of fish passage?**

A **That sounds right.**

Q **Just to go over the culvert numbers a little bit more. Your testimony is that DNR's repaired 405 case area barriers as of April 2009?**

A **Yes.**

Q **And in the case area, it has 455 more barriers to repair?**

A **Yes.**

Q **And of those 455 barriers, your testimony is that 228 are barriers to anadromous salmon?**

A **Yes.**

Q **Could you please take a look at Exhibit C to your amended declaration, which is Exhibit W-094-C?**

A **Okay.**

Q **Now, in this pie chart, 46 percent "no habitat" section, which was the biggest segment to the pie, represents culverts removed from the inventory because the stream was reclassified as non fish bearing; is that correct?**

A **That's correct.**

Q **And for these culverts, DNR will not be taking any corrective action?**

A **The only corrective action that we took is the fact that we evaluated the stream for fish and for fish habitat and found that those two were not present.**

Q **But you -- DNR is not planning to repair or remove that culvert as a result of this determination on fish-bearing status in the stream?**

A **That's correct. There is no on-the-ground activities that are going to occur.**

Q **It is true that DNR has made a significant effort in the past few years to survey certain barrier culverts on its inventory in an effort to reclassify them as non fish bearing; is that right?**

A **We have made a survey of our marginal habitat, and our marginal habitat is habitat in the upper and the headwater streams, so the vast majority of those surveys have occurred on resident streams. They're going to be trout streams or sculpin streams.**

Q **Now, this effort you made to do these stream surveys, that has been more intense in the past few years; isn't that right?**

A **Yeah.**

Q **And to accomplish that goal, you hired a consulting firm called Forest & Channel Metrics?**

A **They were one part of that effort to look at those marginal streams, yes.**

Q **There were other stream surveys conducted by other parties to evaluate this issue?**

A **Yes.**

Q **And is it correct -- does it sound right that Forest & Channel Metrics conducted approximately 97 stream surveys in the**

2007 year?

A I don't have that number with me at this time.

MR. GRUBER: Would the clerk please hand the witness Exhibit AT-130.

By Mr. Gruber:

Q Mr. Nagygyor, if you could look at the top right-hand corner of this document. Is that your name?

A Yes.

Q And that indicates you prepared this document; is that right?

A That's correct.

Q Would you please turn to Page 7. It has at the top of it a table, Table 3. On the left-hand column of that table, the heading is F&CM. That's Forest & Channel Metrics?

A Yes, it is.

Q Does this table refresh your recollection that in the survey year 2007 Forest & Channel Metrics was expected to conduct approximately 97 surveys for the DNR?

A Yes, it does.

Q Could you turn to the previous page and look at the bottom? There is an indication about your expectation for the 2008 season and the stream surveys that would be conducted then; is that right?

A Yes. I read that.

Q When you wrote this document, your anticipation was that approximately 44 Northwest region stream survey projects would be

undertaken in 2008; is that right?

A That's correct.

Q Now, as a result of this recent effort to reclassify streams, you anticipate that going forward, the percent of no-habitat culverts among the remaining 455 case area barriers will decrease substantially to 46 percent; isn't that right?

A I expect there will be a decrease and a change in that pie chart there, yes.

Q Let me ask you this. How many more of the 455 case area barriers does DNR intend to conduct stream surveys for?

A I can't give you that exact number. I don't have that number. I would have to inquire of the regions. I can tell you that it's going to be substantially less than what we did in 2007.

Q How about in 2008, when you expected 44?

A It's going to be less than -- it should be less than 44 that we expected in 2008.

Q So isn't it true that going forward, DNR will actually have to remove or repair a greater percentage of barriers from 2010 through 2016 than it did in 2008 in order to meet the 2016 deadline?

A It's true the fact that there's going to be less barriers taken off the list because there's no fish and no fish habitat. That's true.

Q But to remove the remaining culverts, you will actually have

to do some work at those culverts, correct?

A Yeah. Those barrier fixes are going to cost us additional money on the average barrier cost than what we saw in 2007 and 2008.

Q Now, isn't it true that since 2001 when DNR's inventory report was completed that DNR has prioritized its low-cost barrier repairs?

A I'm not sure what you mean by "prioritized low-cost barrier repairs."

Q Haven't you done the less expensive barrier repairs first, including reclassifying a stream, thereby removing the culvert from your list without doing any actual work on the culvert?

MR. FERESTER: Objection. Compound question.

THE COURT: Let me have you break it down.

By Mr. Gruber:

Q Maybe I could have you look at an exhibit that might help refresh your recollection. If you could look at that same exhibit, AT-130, and turn to Page 5, please. If you could look at the text above the first full paragraph and read the last two sentences of that.

A Which paragraph?

Q The middle paragraph, the one that starts with, "Since we have begun."

A Okay.

Q Does this refresh your recollection that when you prepared

this document you observed that DNR's trend was to fix the low-cost barriers and that trend has held true between 2001 and 2007?

A Yeah. It refreshes my mind that we've gone in and done quite a bit of work to correct our fish inventory to make sure that we are spending our money on streams that actually have fish habitat and fish presence.

Q Now, DNR -- you testified earlier about the ARRF account; is that right?

A Yes.

Q And the ARRF account is the primary means by which DNR accomplishes its culvert repairs; is that right?

A That's correct.

Q And you also talked about Exhibit AT-131, which is a document you prepared in December of 2008 addressing the ARRF account; is that right?

A That's right.

Q Is it your opinion that, based on the assumptions of future volumes of timber sales and estimated engineer and project costs, the ARRF account is underfunded by approximately $50 million needed to complete DNR's culvert repairs by the 2016 deadline?

A Yes.

Q To address this funding problem, you recommended an increase in the ARRF fees applied to timber sales; did you not?

A I did.

Q **In fact, you recommended that this fee increase be implemented as soon as possible?**

A **I did.**

Q **Isn't it true that the recommendation contained in that document has not been advanced to DNR management?**

A **DNR management is aware of our funding shortfall and they are aware of that document.**

Q **I thought I heard you testify earlier you had discussed this document with your supervisor but had not passed it on to higher levels of DNR?**

A **That was in December of 2008. I discussed it with my manager at that time. And at that time, he decided not to bring it up the chain of command.**

Since then, we've had a new commissioner, a different executive in the agency, and I believe they've actually seen that document now.

Q **DNR has not taken any action to approve your recommendations to the State, have they?**

A **There's been no increase in the ARRF fee, that's correct.**

Q **I would also like to ask about an earlier recommendation you made. Do you recall that the forest roads program requested a fee increase in fiscal year 2008?**

A **Could you be more specific in fiscal year 2008 what calendar months those are?**

Q **Well, perhaps you could look at the Exhibit AT-131 at Page 2.**

I believe you address it. If you look at the paragraph below the table, towards the bottom of that.

A Page 2?

Q Page 2. The paragraph below the table, it's the second-to-last sentence.

A Yes.

Q So the recommendation for a fee increase of the ARRF account that is referred to here occurred prior to the recommendation made in this document; is that right?

A That's true.

Q And that recommendation was also declined by DNR's management?

A It was declined by my supervisor. I'm not sure to what level he took it.

Q One of the issues that you address in this document is what you call very high-cost repairs; isn't that right?

A That's true.

Q And isn't it true that DNR does not know the number of high-cost culvert repairs that remain?

A I don't have that number with me today.

Q And is it also true that DNR hasn't specifically determined the costs of these very high cost of culvert repairs?

A Not every one has been determined.

Q Could you please take a look at amended Exhibit E to your amended declaration, that's Exhibit W-094-E. Now, in this graph,

the yellow line indicates the proposal of DNR's regional offices to repair the remaining barrier culverts statewide; is that correct?

A **Yes.**

Q **And the blue line indicates the number of barrier culverts that were actually removed from DNR's inventory?**

A **Correct.**

Q **And that's -- I believe it's through the 2008 construction year; is that correct?**

A **That's correct.**

Q **Does this chart demonstrate that in some years the regions projected more removals than actually happened?**

A **That's true.**

Q **Now, the region's proposals from 2009 through 2016 doesn't consider the $50 million funding shortfall in the ARRF account that you have predicted, does it?**

A **It does not, no.**

Q **Now, you testified earlier you were familiar with the three primary culvert design methods used -- or referred to in the WDFW Design Manual?**

A **Three?**

Q **Let me ask you this. Are you familiar with WDFW's manual entitled, "Design of Road Culverts for Fish Passage"?**

A **Yes. I am familiar with certain aspects of that manual, yes.**

Q **And does that manual not discuss the hydraulic, no- slope,**

stream simulation design methods?

A I am familiar with the stream simulation and the no- slope design. I'm not familiar with the hydraulic design.

Q You have a general familiarity with that design method?

A I've never designed a hydraulic culvert. I read through that portion of that manual years ago.

Q You generally understand what that design method entails?

A Very generally, yes.

Q And it is true that you are not aware of any culverts installed by DNR using that hydraulic design method since 1997; is that right?

A That's true.

Q In 2007 you recommended to DNR region engineers that all of the culverts they designed in the future be stream simulation culverts and not no-slope culverts; isn't that right?

A That's correct.

Q Earlier today you testified that it is DNR's practice that essentially all of their culvert repairs will be using the stream simulation design, with maybe a few exceptions that might be no-slope; is that right?

A That's correct.

Q Now, isn't it true that DNR's official guidance to its engineers indicate that stream simulation is the preferred design method for fish passage culvert repairs?

A That's correct.

Q **Now, is it also true that DNR's guidance to its regional engineers indicates that no-slope is not preferred as a design method?**

A **I don't recall it specifically saying "not preferred."**

Q **Are you familiar with the Fish Passage Design Guidance that DNR keeps for its regional engineers?**

A **What's the title of this guidance?**

Q **It's an on-line manual entitled, "Fish Passage Design Guidance."**

A **Is that that flow chart?**

Q **I believe it is a flow chart.**

A **Okay.**

Q **Are you familiar with it?**

A **Yes.**

Q **Could you please take a look at AT-117.**

Does this look like the Fish Passage Design Guidance flow chart?

A **Yes, it does.**

Q **Now, this is an on-line document, so that each of the boxes on the first page opens up a link to other documents which then may actually be linked to even additional documents?**

A **That's true.**

Q **If you could look at the second page, please. This is one of those links, entitled "Structure Selection." Let me just ask you a general question about the guidance.**

Is this the type of document that a regional engineer would look to for guidance when designing a fish passage repair project?

A **No.**

Q **Has it been superseded by additional guidance?**

A **No.**

Q **Has it been withdrawn as guidance?**

A **This little -- I'll make it easy on you. This document has been specifically written for Engineer IIs and engineers that are new to the agency and new to designing structures. It's not specifically written for folks that have multiple years of experience that already understand the design process of no-slope and stream simulation and have design experience.**

Q **So a DNR engineer that's actually designing a culvert repair project would not be a level II engineer? Is that who you said relies on this manual?**

A **Natural Resource Engineer II, Natural Resource Engineer I; somebody that's not familiar with that process. This would be a document they'd use to help them along in designing a structure.**

Q **So those levels of engineers within DNR who do not design fish passage repair projects; is that what you're saying?**

A **No. I'm saying they use this document to assist them in that design process.**

Q **And so one of those engineers, in looking at this, would take this as guidance for the proper way of designing a fish passage**

project?

A Yes.

Q If you could look at the second page, please. In the middle of the page, I believe it addresses the three methods -- three design methods that we have discussed earlier. And does it not say for the no-slope design method that this is not a preferred method?

A It specifically says, "not preferred method but applicable to stream gradients less than 3 percent and culverts less than 75 feet long."

Q Now, it's DNR's practice to monitor its fish passage culverts after a flood or storm event; is that right?

A We typically go out there and inspect culverts after a flood event.

Q And DNR does not have a designated monitoring program where it inspects its fish passage culverts on a periodic basis?

A We don't have a monitoring program that is periodic in nature. We do have inspections that go on. And I just -- And I have a distinction between a monitoring program and an inspection program.

Q How do you distinguish those two?

A An inspection program would be where you go out there and visually inspect that culvert to make sure that it's still functioning. To me, a monitoring program would be you going out there and you're evaluating that culvert to see whether or not

the design process that you use, the design practice that you use, the objectives that you wanted to achieve with that structure are still functioning out there.

Q Could you describe the department's, what you describe as an inspection program?

A Okay. DNR went out and inspected all its structures with the Road Maintenance Abandonment Planning Act associated with the Forest Practices Act starting in 2000 and completed in 2005.

At that point we identified all of the work that we need to do on our roads out there, including fish passage structures, including structures that don't meet a 100-year flood event, and a lot of other work that we needed to get done out there on our forest road according to that Forest Practices Act. So that was in kind of the baseline assessment.

Since then, we inspect our culverts after flood events. We also inspect our culverts on a non-routine basis when we report what our activities are going to be for the next construction season associated with our annual plans. So every year, we will meet with forest practice and say we're going to do this work in this block of land. That means we've gone out there, we've looked at all those structures out there and are going to complete some maintenance work on those structures, or replacement work.

Q Now, you mentioned that there have been -- DNR has repaired 405 barriers in the case area?

A **Yes.**

Q **How many of those barriers in the last year do you know DNR has inspected under the program you just described?**

A **I don't have that number at this time.**

Q **You don't have that number because DNR doesn't keep a centralized record of the inspections?**

A **That's true.**

MR. GRUBER: Would the clerk please hand the witness Exhibit AT-212, please.

By Mr. Gruber:

Q **Do you recognize this document?**

A **Yes, I do.**

Q **And it is a draft of the Forest Roads Guide, Chapter 4; is that correct?**

A **That's correct.**

Q **Did you participate in drafting it?**

A **Yes, I have.**

Q **And the draft is dated 2009, correct?**

A **Correct.**

Q **Do you know if this draft Forest Roads Guide includes a formal maintenance and inspection program?**

A **It does not include a formal inspection program.**

Q **Would you please turn to 4-21, which is toward the end of the document.**

Does Section 4.8 not address inspection and maintenance?

A **Yes, it does. And I thought when you meant "formal inspection program," it would be a program that would require the regions to report to the headquarters office their accomplishments on a yearly basis so that we could do some sort of monitoring of their program, or auditing.**

Q **Does the inspection and maintenance section here request that people in the field looking at these culverts look for whether there's been a loss of stream function or fish passage function?**

A **Yes. Down there in Item 5, sub-item F, it does say that.**

Q **And isn't it true that this draft, Forest Roads Guide, requires that the DNR database addressing bridges and culverts be updated based on these inspections? I believe that is addressed on the last page at the bottom.**

A **Yes, it does.**

Q **Now, it is true, is it not, that currently no such requirements are in place regarding an inspection and maintenance program or the requirements to update the database based on those inspections?**

A **There are currently no guides out in this form that requests or mandates this sort of inspection program.**

Q **So, in other words, this is a change to the current Forest Roads Guide?**

A **That's true.**

Q **And has this draft been finalized and approved by the agency?**

A **It's still in its draft form.**

Q **You would agree, would you not, that on the whole, DNR has a positive working relationship with the tribes in its culverts removal program?**

A **Yes.**

Q **Now, your testimony, and I actually believe it's more in your declaration than in your direct testimony today, includes some analysis of historic culvert repair costs for DNR; isn't that right?**

A **Yes.**

Q **Now, DNR has traditionally used historic costs to predict future culvert repair costs after applying an inflation factor; isn't that right?**

A **Yes.**

Q **And hasn't DNR found historic costs used in this way to be a reasonable indicator of future DNR culvert repair costs?**

A **Yes.**

Q **You also testified earlier about the WAC or the rules?**

A **Yes.**

Q **And you are familiar with those rules?**

A **With some aspects of that rule, specifically dealing with forest roads.**

Q **And those are the -- those rules are essentially the source of the 2016 deadline that you talked about?**

A **Yes, they are.**

Q **Do you know why culverts were included as part of forest and**

fish rules in the 2016 deadline?

A Culverts, or roads in general, are a significant impact to the natural resources out there when we extract timber. So it just makes sense that if you're going to put together strategies and BMPs and goals and objectives to minimize the impact to forest roads that you also address culverts.

Q Has the 2016 deadline encouraged DNR to focus its efforts on culvert repair in order to make reasonable progress to meet the deadline?

A Yes.

MR. GRUBER: If I could ask the clerk to please hand the witness AT-152.

Your Honor, this is an exhibit that has not yet been admitted.

By Mr. Gruber:

Q Have you seen this document before?

A Yes, I have.

Q Was it prepared by DNR staff in the Pacific Cascade region?

A Yes, it was.

Q And they prepared it in the regular course of DNR's activities related to the culvert repair programs, did they not?

A They did.

Q And the Pacific Cascade region of DNR is partially within the case area, isn't it?

A That's correct.

Q **And isn't it true that DNR conducts the stream surveys that we've been talking about both inside and outside the case area?**

A **You're talking about the protocol surveys?**

Q **Yes.**

A **Yes.**

MR. GRUBER: Your Honor, we move for the admission of AT-152.

MR. FERESTER: Your Honor, we had an objection to AT-152 because, although these questions weren't directed to the witness, a large portion of the Pacific Cascade region, perhaps two-thirds of it, are outside the case area.

This document, some 12 pages, has information on lots of streams that are not within the case area and thus not subject to this proceeding.

THE COURT: But since there is a portion within it, any other objections, Counsel?

MR. FERESTER: No, your Honor.

THE COURT: All right. AT-152 will be admitted.

Mr. Gruber, how much more do you have on cross?

MR. GRUBER: A couple minutes, your Honor.

THE COURT: Let's go ahead and take our break.

(At this time, a short break was taken.)

THE COURT: Mr. Gruber, you may continue.

By Mr. Gruber:

Q **Mr. Nagygyor, you responded to a question from Judge Martinez**

regarding monitoring. I believe you talked about a monitoring study that Bob Barnard was conducting; is that right?

A Yes. It was a combination of a project that the Department of Natural Resources and Department of Fish and Wildlife did together.

Q And that study is looking at DNR culvert repairs?

A Along with other culverts.

Q By other agencies?

A I believe so.

Q Do you know the number of culverts that are part of that study?

A We've looked at 30 culverts on DNR lands.

Q Do you know if Mr. Barnard has completed the study?

A I believe it is not completely published yet.

Q Do you know if he has sufficient funding to complete or publish the study?

A I don't know.

Q In assisting the State's attorneys in preparing this case, you reviewed the report of tribal witness Tyson Waldo, did you not?

A I read a small portion of that report.

Q And the portion that you read addressed his methodology for estimating the potential fish production from the removal of DNR's barrier culverts?

MR. FERESTER: Objection. The evidence regarding

potential fish production has been excluded by motion and order of your Honor.

THE COURT: I don't know where you're going.

MR. GRUBER: Your Honor, we're moving in this direction because, as the Court is well aware, we offered testimony from Mr. Waldo which the Court excluded as too speculative, and we believe we should be allowed to at least ask state witnesses who have considered Mr. Waldo's methodology whether they are aware of better or different methodologies that could -- the tribes may have been able to use to make a showing that Mr. Waldo attempted to make for the tribes.

THE COURT: All right. I'll give you a little bit of leeway in this area, but --

MR. FERESTER: I would also say that this material is also beyond the scope of direct.

THE COURT: Overruled.

Go ahead.

By Mr. Gruber:

Q So is it correct that you did review Mr. Waldo's methodology for estimating potential fish production from removal of DNR's barrier culverts?

A I reviewed a portion of that document. I didn't review the entire thing.

Q Are you familiar with Mr. Waldo's methodology that involved a measurement of habitat gain?

A **I am -- I know the fact that he used some of DNR's information from our database to come up with habitat.**

Q **And as a result, predict fish production gain; is that correct?**

A **That is correct.**

Q **And you would agree that estimating changes in fish production from removing barrier culverts is a difficult task, would you not?**

MR. FERESTER: Objection, your Honor. This is beyond the scope of this witness's expertise.

THE COURT: Overruled. I'll let him answer.

THE WITNESS: Could you repeat that question, please?

By Mr. Gruber:

Q **You agree that estimating changes in fish production from removing barrier culverts is a difficult task?**

A **I've never completed that task before. I'm an engineer. I'm not a fish biologist. I've never calculated production numbers.**

Q **Do you remember when I asked you this question at your July 20th deposition?**

A **Could you refresh my memory on that?**

Q **Yes. If you could look at Page 25, beginning at Line 14. I'm going to read here.**

Question: "Would you agree that estimating the potential increase in fish production based on removal of barrier culverts is a difficult task?"

Answer: "I would agree with that."

Did I read that correctly?

A **You did.**

Q **And I also want to ask you, you are also unaware of a superior method than that employed by Mr. Waldo in estimating potential fish production achieved by removing barrier culverts; is that correct?**

MR. FERESTER: Objection, your Honor. Beyond the scope of direct and beyond the witness's expertise.

THE COURT: It is, Counsel.

MR. GRUBER: That's my last question.

Thank you, Mr. Nagygyor.

MR. MONSON: Good Morning, your Honor. I'm Peter Monson for the United States.

CROSS-EXAMINATION

By Mr. Monson:

Q **Good morning, Mr. Nagygyor.**

A **Good morning.**

Q **My name is Peter Monson, and I represent the United States, and I think we had the pleasure of meeting each other at one of your depositions back in June.**

Do you recall that?

A **Yes, I do.**

Q **I just have a very few questions regarding Paragraphs 36 through 49 in your report, which is marked W-094. In those**

paragraphs you discuss the funding levels for forest roads owned by the U.S. Forest Service; is that correct?

A That's correct.

Q And you make a comparison -- excuse me. The entire section is titled "Comparisons to USFS and Other Large Forest Landowners," correct?

A Correct.

Q But the only forest landowner that you discuss in these paragraphs is the U.S. Forest Service; is that correct?

A And DNR.

Q And DNR, right. Have you ever been employed by the U.S. Forest Service?

A Occasionally in the summertime, I'll be a wild land firefighter, and they will pay my salary. Never as an engineer.

Q And you haven't had any exposure to the Forest Service budgeting process, have you?

A No, I have not.

Q And the estimates that you give for the Forest Service's annual road maintenance budget, is that solely based on the 2005 paper that you cite on Footnote 10?

A Yes, it is.

Q And that would be Exhibit F to your declaration?

A I will take your word for it.

Q And that's what Footnote 10 says, just for the record. That's Exhibit F.

Did you look at any other documents or have any other information regarding Forest Service funding levels for road maintenance expenses when you prepared these paragraphs?

A I believe there was a second Forest Service document that was published that I read, but the information that I used to generate these numbers came out of that 2005 document.

Q Okay. Now, the second document, do you recall when that was prepared?

A I believe it was a more recent document that talked about some of the challenges that the Forest Service had.

Q Do you know whether it also discussed increases in funding levels by the Forest Service? Do you recall that?

A I don't recall specifically that it talked about funding. I think it didn't talk about funding to the level of detail or it was a little more of a general document of their program and their accomplishments.

Q Do you have any independent knowledge as to whether Forest Service funding levels have increased since 2005?

A Recently I understand that the Forest Service has obtained some stimulus money that they've used to complete -- or are planning to complete some projects with that stimulus money.

Q Do you know if there have been any other increases?

A I'm unaware of any.

Q And you didn't reference -- in preparing your amended declaration, you didn't make any changes to include the reference

to stimulus money or any other increases in funding to the Forest Service road maintenance?

A I did not.

Q You didn't have occasion to call Mr. Erkert, who was the author of that 2005 paper, did you?

A I did not.

Q So any changes that may have occurred between 2005 and 2009 are not reflected in the information you present in Paragraphs 36 through 49; is that correct?

A That's correct.

MR. MONSON: I have no further questions. Thank you, Mr. Nagygyor.

THE COURT: Thank you, Mr. Monson.

Counsel, before you ask, I have a question.

You mentioned the DNR classifies some of these barriers as very high-cost repairs. How do you define that?

THE WITNESS: Our repairs that we typically do, our average cost is around $60,000 or so. When we have to do repairs that are on two lanes of paved road or with substantial amounts of fill, then we start getting into repairs that are going to cost us $300,000, somewhere around there. And that's just approximately. Our high cost repairs are projects that we don't normally see out there, non-routine in nature for us.

THE COURT: Of the miles that you have under your jurisdiction, how many of them would fall under the two-lane

paved road?

THE WITNESS: For barriers? And this is just the case area?

THE COURT: Yes.

THE WITNESS: That would be excluded to two sections of road, one up to Cedar Creek and one up to our correction facility then on the Olympic Peninsula. I would say less than 20.

THE COURT: And one other area. You talked about the difference between inspecting and monitoring after a flood event. Do you remember that?

THE WITNESS: Yes.

THE COURT: When your agency inspects and they see that there's a problem with that particular culvert, do you track it? do you fix it? do you prioritize it? how do you deal with it?

THE WITNESS: It depends on what they observed. What has traditionally happened the last couple of winters, we've had a couple large storm events that come down, a lot of flooding in the low lands, a lot of damage in the uplands, too, up in the forest lands.

When we go out there and inspect them, we'll go out there and do a broad-based inventory of that whole block and determine all the work that we need to get done on that block as soon as we can. Some of that requires us to walk in, because they're blocked and stuff like that.

We'll determined whether it's work that we can do in the

wintertime, whether it's work that we need to do right now because we need access to specific area. Maybe we need access to a communication tower that has 911 service up there. That's stuff that we need to do right now.

Other work that we might need to get done is we would review when we have a contract out there to harvest wood, we've got a contractual obligation to open that road up.

Projects that we would wait on would be projects that were not immediately needed to open that road, and we realize that those sites can wait until the construction season. We can get an HPA -- routine HPA and complete those projects at our convenience.

You talked about the inspection. You know, it could be as easy as you go look at a culvert -- and these could be small culverts or they could be a larger fish passage culvert. It could be as easy as a small culvert that has some debris in front of it, you jump out of your pickup, you clean it out, or it could be as much as we have to get a piece of equipment out here right now, we can save this culvert, save this road.

The worst case scenarios for us is when we have some sort of mass wasting event: a mix of debris, wood, water, soil comes down, it takes out a whole strip of trees. Maybe it takes out the road. Maybe it stops at the road. Those would be large events that typically require us to do a lot more planning, some design work, clean up that material to ensure that the resources

are being protected, the damage is being minimized, and to provide access.

THE COURT: And it's my understanding that the Army Corp of Engineers has indicated a potential problem with the Howard Hanson Dam.

Does that affect any of your culverts, or can it affect it?

THE WITNESS: I am unaware of any association with the Howard Hanson Dam and DNR culverts.

THE COURT: Thank you.

You may inquire, Counsel.

REDIRECT EXAMINATION

By Mr. Ferester:

Q Mr. Nagygyor, since we have just been talking about inspection and maintenance, why don't we start with that subject.

How would DNR pay for an inspection and maintenance program? Where would the funds for that come from?

A The funds for that sort of program would come out of the Access Road Revolving Fund.

Q And that's the very account we've been talking about having some shortages of money; is that right?

A Yes, it is.

Q And I believe Counsel mentioned that the account would be underfunded by some $50 million, looking at the variety of projects and obligations that the DNR has under its ARRF account.

As far as barrier repairs go and the State's programs, what

is the State obligated to fix under state law?

A Under state law, we are obligated to fix all species of fish at all life stages. We are obligated to fish, resident and anadromous, across the entire state, which is dealing with culverts. We are also obligated to fix sediment that delivers to streams. We're obligated to fix unstable roads. We're obligated to inventory orphaned roads. We're obligated to improve our roads through best management practices, or BMPs.

Q So when you wrote your memo that is Exhibit AT-131, were you looking at all of those obligations?

A All those obligations, from fixing culverts to road maintenance to road abandonment to road management.

Q I believe Counsel referenced that you had requested an ARRF, Access Road Revolving Fund, fee increase in fiscal year 2008?

A That's true.

Q What was occurring economically in fiscal year 2008?

A That's when we were -- the beginning of the downturn of the timber market.

Q Counsel also talked about significant efforts to reclassify streams. Is it difficult in the forested environment to determine how far up a stream resident fish may travel?

A It's difficult to just observe a stream and go to a section of stream or segment of stream and determine fish habitat, fish presence. To do it adequately, you need to follow the protocols described in the manual and follow that process to determine

where the last fish is and then the last fish habitat.

Q And why is DNR spending some additional time on determining where those boundaries are?

A It's prudent for us as land managers to spend our funds wisely, and we don't want to be spending our limited resources on improving structures that don't have fish habitat or fish presence there.

Q In terms of the reclassification effort, what types of streams would that apply to?

A For the most part, those are going to apply to resident fish streams.

Q And those are not the subject of this case, right?

A That's correct.

Q Let's talk for just a moment about historic costs. How do the costs of repairing a barrier culvert on a forest road generally compare to the costs of replacing a barrier on a state highway?

A They are orders of magnitude difference in cost and difference in complexity.

Q Are you able to state whether historic costs would be reasonably related to future costs for a highway culvert repair?

MR. GRUBER: I'm going to object, your Honor. This witness has not testified that he's familiar with DOT highways or culvert repairs for DOT.

THE COURT: Foundation question. The objection will be

sustained.

MR. FERESTER: Well, that was the point, your Honor. Thank you.

THE COURT: You may step down. Thank you.

Do we have another witness on behalf of the State?

MS. WOODS: The State will call Robert Barnard, your Honor.

THE COURT: Mr. Barnard, I'm going to have you raise your right hand to be sworn.

Whereupon,

ROBERT BARNARD

Called as a witness, having been first duly sworn, was examined and testified as follows:

THE CLERK: Please state your full name and spell your last name for our court reporter.

THE WITNESS: Robert J. Barnard, B-A-R-N-A-R-D.

THE COURT: Ms. Woods, before we start, I believe his declaration is W-089. Of course, it has not been admitted. 89-A, B, C, D, E, F and G have all the been admitted. I think that leaves only 89-H.

MS. WOODS: That matches our records as well, your Honor.

THE COURT: Thank you. You may inquire.

DIRECT EXAMINATION

By Ms. Woods:

Q **Good morning, Mr. Barnard.**

A **Good morning.**

Q **Mr. Barnard, where do you work?**

A **I work for the Washington Department of Fish and Wildlife in the habitat program.**

Q **How long have you worked for the Washington Department of Fish and Wildlife?**

A **Thirteen years. Actually, 14 at the end of next month.**

Q **What are your job responsibilities?**

A **I represent the agency in technical matters, fish passage and habitat. I design fish passage projects. I provide technical assistance on fish and fish habitat-related issues to staff and to outside agencies, and I prepare guidance documents and training materials in these areas.**

Q **Would you please describe your educational background?**

A **I have a Bachelor of Science in civil engineering, and I have various professional courses in hydrology, geomorphology.**

Q **Mr. Barnard, do you have a professional engineer's license?**

A **I do. It's currently paid up.**

Q **Did you prepare a Declaration in Lieu of Direct Testimony for this sub-proceeding?**

A **I did.**

MS. WOODS: And the Court has already alluded to it. If Madam Clerk would please hand Mr. Barnard a copy of -- or the binder that has Exhibit W-089 in it, please.

By Ms. Woods:

Q Do you have it, Mr. Barnard?

A Yes, I do.

Q Do you recognize Exhibit W-089?

A I do.

Q What is it?

A It is the Declaration of Robert Barnard, PE, in Lieu of Direct Testimony.

Q Would you please turn to Page 25?

A Yes.

Q Is that your signature on Page 25?

A It is.

Q What is the date of your signature?

A 3/19/09.

Q Mr. Barnard, do you adopt the Declaration of Robert Barnard PE in Lieu of Direct Testimony, dated March 19th of 2009, as your direct testimony today?

A I do.

Q Would you please turn to Exhibit W 089-H.

MR. STAY: Excuse me, your Honor. Just for Ms. Woods, we're not going to object to H, if you were trying to lay foundation.

You may go forward without objection.

By Ms. Woods:

Q Do you recognize Exhibit W-089-H?

A I do.
Q What is it?
A It's a slideshow that I prepared for the Court to explain some of the issues that I brought up in my declaration.
THE COURT: You're asking to admit H?
MS. WOODS: I would like to have admitted Exhibits W-089 and W-089-H.
THE COURT: And Mr. Stay, you've got objections to 089?
MR. STAY: We do. But we are going to, under the stipulation, your Honor, reserve those objections, allow the admission subject to those objections which we may raise later on as permitted.
THE COURT: Thank you.
You may proceed, Ms. Woods.
By Ms. Woods:
Q Mr. Barnard, does your job involve culverts?
A Oh yes. I would say 70 to 100 percent of my time, depending on the season, is involved in culvert-related issues.
Q Do you design culverts?
A I do.
Q About how many culverts have you designed?
A I don't actually keep track, but probably in the neighborhood of a hundred culverts I have designed that have actually a drawing and a report associated with that.
And then when we used to keep track of our technical

assistance, I averaged about 100 culvert technical assistances a year, so that's probably in the neighborhood of 12- or 1,400 culverts.

Q Have you designed structures for projects that were sponsored by any indian tribe?

A As a matter of fact, Mike McHenry, a witness here earlier, I designed him a bridge several years ago. I also spent a fair amount of time with his team in the field on his Salt Creek barrier removal project.

Q Do you work with other tribal biologists in your job?

A I do. Some tribes are very involved in the HPA process.

Q Would you please turn to Exhibit W-089-B?

A Yes.

Q What is that?

A That is "Design of Road Culverts for Fish Passage," dated 2003.

Q Is it okay if I call that the WDFW Culvert Design Manual?

A Or culvert manual, sure.

Q Are you one of the authors of the culvert manual?

A I am. I wrote a number of sections in here, specifically the stream simulation and roughened channels sections and also sections on identifying bankful width. And I was general editor to the document as well.

Q Have you done any research on culverts?

A I have. In the last ten years, I've done two research

projects on stream simulation culvert effectiveness.

Q Would you please turn to Exhibit W-089-G?

A Yes.

Q What is that?

A It's "Evaluation of Stream Simulation Culvert Design Method in Western Washington," a preliminary study. And it's a draft document.

Q Is that document one of the studies that you referred to a moment ago?

A Yes, it is.

Q And you mentioned that it says "draft" on it.

Have you made that paper publicly available?

A Oh, yes. It's featured on our website, along with the culvert manual guidance documents. It's freely available.

Q And you mentioned that you had another study; is that right?

A Yes. I'm currently engaged in cooperation with the Department of Natural Resources, a study of 50 stream simulation culverts. It's a continuation of the first study. The first study involved 19 culverts, and this one currently involves 50. An increase in the number of culverts was to overcome some of the shortcomings of the first study because of the lack of sample size.

Q You thought that 19 was too small of a sample size?

A Yes.

Q In your opinion, would eight culverts be a large enough

sample size to give statistically significant results?

A I suppose it depends on what you're trying to say. Sample size is a function of the variance in the population and the degree of certainty that you want to have in your answers.

So, for instance, if you look down at the bed of the stream, the gravel bed stream, and you wanted to know the average particle size, let's say, of that stream, if you -- if all those particles were the same size, you could pick up one and measure it and have an idea of what the average size was. But there was a variance in the particle size, very small particles to very large ones, and you wanted to have a great deal of certainty in your result, you would have to pick up very many particles and measure them.

Q Are you preparing any papers for publication?

A Yes. Right now I'm just in the final stages of preparing my 50 culvert stream simulation study.

Q Has your 19 culvert study been cited in other publications?

A It has been. I have given it at various conferences. I gave it at the AFS conference in Quebec a number of years ago. I gave it to the Forest Service in Oregon. I can't remember where the other places that I've given this paper at.

It's been cited in one document, the 2007 synthesis report from federal highways for fish passage.

Q Would you turn to Exhibit W-089-E, please?

A Yes.

Q **Is that the federal highways publication that you just mentioned?**

A **Yes, it is.**

Q **All right. An excerpt thereof?**

A **Right.**

Q **You mentioned that you presented your paper at a variety of conferences. Have you given training presentations on culverts?**

A **Yes. Actually, this is a very important, large part of my duties at Department of Fish and Wildlife. Just two weeks ago, I gave a presentation on culvert design to the county road administration board.**

Biannually we give culvert training as a service to the State, it's a day-and-a-half training session, of which excerpts of it are in part of my declaration. And I gave -- provided training to the oceans and fisheries Canada senior staff some years ago in developing a culvert -- involving a stream simulation design and monitoring program. I regularly am giving presentations about culvert design and fish passage.

Q **Have you done any cost estimating for culverts?**

A **When an engineer does a formal design, a cost estimate is usually a part of it.**

Q **What is the process for deciding what kind of culvert to design?**

A **What you're seeing right here is part of a flow chart, a much longer flow chart totally, from the culvert manual. There's**

three sections at the top of this here of concern, what you would discuss in any type of a crossing, whether that crossing is necessary or not.

Particularly in the forested environment, roads can change locations and we can not have that crossing at all. Crossing sitings are important, crossing either laterally or longitudinally, to improve the characteristics of the crossing. And then habitat considerations, which I spend a fair amount of time in my declaration outlining. These are considerations that one would apply to the habitat impacts of choosing a given culvert design method, particularly the concept of ecological connectivity is important in understanding what is the most appropriate structure. And then we have bifurcate in this process, then, between a bridge and a culvert.

The general rule of thumb for whether the crossing should be a bridge or a culvert is a bankful width of 15 feet. So larger than 15, we generally apply a bridge; smaller than 15 feet, a culvert. Clearly that's a fairly gray area because we have very large culverts that look pretty much like bridges, and we also have very small streams that are also spanned by a bridge.

I'm not going to talk about bridge design at all. On the culvert side, you have three basic methods, two of them are outlined in our Washington Administrative Code 220.110.070. We have a no-slope method and the hydraulic design method. And the third one, which is stream simulation, which is not featured in

the WAC, although we include it in our suite and include it in our hydraulic project approvals because it provides at least as good a passage than either of the two designs which are featured in the code.

Q Let's have you give a brief description to the Court of these three design methods, starting with the no-slope method.

A So a no-slope method was developed -- or is included in the WAC to fill a specific purpose. And the purpose is that culvert designs is a very complex process. And this method is made available for people who, let's say, would want to replace their driveway culvert and they don't want to hire an engineer. They want to do this themselves. They own a backhoe, and they would like to replace the culvert themselves. So they need a method that they can design a culvert which provides fish passage and functions efficiently in the stream channel.

And so the no-slope method has three aspects. One of them is that the culvert is laid at a flat gradient; hence, the name no-slope. The second one is that the downstream end of the culvert be countersunk at least 20 percent below the stream channel. That means that there's a bed inside the culvert with stream material inside of it. The third one there is that the width of the bed of the culvert must be equal to the channel bed width. In the manual, we clearly defined that as the bankful width of the stream.

As you can see from this drawing, with a round culvert in

there, the actual width of the bed is less than the diameter of the culvert. So let's take, for instance, if the width of the -- bankful width of the stream is five feet, then the no-slope culvert, because of the geometry in this particular situation, is going to be 125 percent larger than that, than let's say 6.25 feet, which we would probably round up to seven feet. We were trying to do that the other day.

Then we added a fourth aspect to this, which limits the use of the no-slope method to lower gradient streams, the method of the upstream counters, upstream of the inlet can be countersunk no more than 40 percent of the rise.

Let's see. Next slide.

Q Have you designed any no-slope culverts?

A Oh, yes.

And so this is an example of a no-slope culvert. It is Bear Creek. We talked about the fact that - I just want to mention this - that there is sometimes a difficulty in telling the difference between a bridge and a culvert. With a headwall like this, this culvert is really just the length of the roadway's width. And if this was wider, we would have a very difficult time telling the difference between calling this a bridge or calling this a culvert. But in this particular case, this is a culvert. And we can see that there's material outside of this, that the water surface is relatively uniform from the adjacent channel through the culvert and that the culvert is approximately

the same width as the streambed.

Now, there was some discussion the other day about the fact that at flows above bankful, that there would be increased velocity or increased hydraulic conditions, let's say, inside the culvert. If you turn to the next slide, you can look at a hydrograph of the stream. So what this is showing is we have a survey cross-section here, the heavy dark line, of a stream. This is Newberry Creek in Grays Harbor County on U.S. Forest Service land.

And then there's a horizontal blue line, which indicates the bankful stage of the stream and also the bankful width. Beneath that is a stage hydrograph. What this is is a record of the water surface elevation as a function of time. And so what we see started on the left-hand side and progress through time, it's not raining for a period of time.

The period of time for this hydrograph is between October and February in 2007. And as we proceed through time, it's not raining, and then it rains, we get runoff, and then the water surface elevation increases.

And so this happens occasionally -- well, all the time out there on the coast, basically in the rain forest. So we can see that the vast majority of the time, the water surface elevation is below bankful, so that the condition inside the culvert in terms of, say, its width and hydraulic conditions, is roughly the same as they are inside the culvert, except there is one peak

that occurs off towards the left where the water surface elevation for, it looks like some period of hours, was greater than the bankful elevation.

And so if you want to, you can -- I can draw on this thing, right? Should I try that or is that a mistake?

Q Go ahead.

A It's not working very good. How do I get rid of it?

THE COURT: You can be John Madden here.

THE WITNESS: Who's that?

Okay. One more time. There we go. So there's the water surface elevation during that peak event -- and actually, that's December 3rd, 2007, the date of that famous storm. And so we can see that the width actually at that peak flow, which is just instantaneous, obviously, is only just a couple of feet wider in this particular cross-section than the bankful width. So we would have a constriction there instantaneously of a couple of feet for a very short period of time.

So actually, the hydraulic conditions inside this particular culvert on this particular stream is, you know, largely the same the vast majority of the time. That doesn't mean that it's never exceeded or that we could have a year in which we had, say, a 100-year event, which would probably be twice the bankful depth, which is going to be somewhere in here.

There we go. So it's several feet wider there, so that would also act as a constriction. But these events don't actually last

very long, and the culvert does require -- does recover from them.

By Ms. Woods:

Q Going back to the picture of the Bear Creek culvert, does this culvert pass transported wood?

A Yes. Actually, we have fairly good research on the size of the wood that is transported by a channel. In Flanagan -- Sam Flanagan's research in northern California, he actually measured all the wood that was transported in the channel during the hundred-year period, and he found that 99 percent of the wood which is transported by the channel is bankful width or less.

Intuitively, you could see that if a piece is longer than bankful, it's likely to lodge someplace and not be readily transported. So he found that the vast majority of the wood transported is bankful length or less. So if we create a structure which is bankful width, we would tend to pass transported wood.

Q This particular culvert depicted in the photograph that you're looking at, did you take that photograph?

A I did.

Q Is that culvert in the case area?

A Yes. This is the Bear Creek -- well, there are many Bear Creeks. This one is in Kitsap County. It is a county culvert. It's like on Olalla Road, I think. I can't remember the name of the road that it's on top of it.

Q **Let's talk about the hydraulic method.**

A **Ooh, what everyone's been waiting for.**

Q **What are the key features depicted on this slide?**

A **This is -- as I say up here, this is sort of a WAC concept, because I don't actually design culverts this way. But this is what the WAC says. The WAC says that the average velocity inside the culvert must be less than a specific value 90 percent of the time.**

It also says that there must be a minimum flow depth, which is also specified, so that there's enough water for fish to swim through. And then it also says that this culvert must be countersunk at least 20 percent below an elevation that's 25 feet downstream of the culvert outlet. And this is to ensure that there is a bed inside the culvert under most conditions.

Q **Have you designed any fish passage structures using the hydraulic method?**

A **I've used the hydraulic method to design retrofits and also to design roughened channels but not to design a culvert in this sense.**

As I said, this is a concept. It's really not been used. It hasn't been used for, I don't know, probably 12, 14 years, although that doesn't mean that people don't call me every week and ask me why they can't use this method.

Q **Why is the hydraulic method not being used much today?**

A **We recognize -- well, a number of things. Number one is that**

we are required to pass all fish. "All fish" means 35 species of freshwater fish, all the salmonids. And that -- the hydraulic criteria is really set up for just a very few number of target species. And also, the target species are all adult fish. So if we're required to pass all fish, then having a method which only specifically addresses adult fish is something which is inadequate.

That doesn't mean that fish that are smaller or fish of other species can't pass at a lesser frequency than the target species. They are not specifically part of the design process. So we can't say with assurance that they have passage for 90 percent of the time because that's -- they're not part of the design process, which is why we now prefer to use stream simulation.

Q Are there situations when the hydraulic method would be appropriate, in your opinion?

A Yes, actually, there are. We have said that it is applicable for retrofits, which I think was in a slide earlier on, and also for exceptional circumstances where the -- where either the no-slope method or the stream simulation method do not apply.

Q Is Washington the only jurisdiction that has used the hydraulic method of designing culverts for fish passage?

A No. It used to be the most common method for using swimming ability to achieve certain hydraulic conditions inside the culvert. And it's still used in many states.

You have to remember also, other places in the country -- you

know, we have 35 species of freshwater fish. You go to the east coast, there's 2- or 300 in there, and they have specific habitat needs. They also, you know, have different levels of awareness of the requirements for fish passage. So people in other states do use the hydraulic -- still do use the hydraulic method.

So what we see in this table here is, in our Washington Administrative Code 220.110.070, the first four columns and the first four rows or so, those are featured in the WAC. And so the white numbers are the numbers that are in the WAC. So we have -- on the top labels of the columns, we have the fish species. And then on the rows, those are the lengths of culverts.

So we have -- now believe that there are trout in just about all the streams that we have culverts on, fish- bearing streams. So we don't even think about adult salmon and Steelhead. We use only the adult trout column, so we have four feet per second for culverts between one and 100 feet and then the velocity requirement. It goes down for longer culverts.

The numbers that are in colors there are -- the yellow ones are for the Oregon Fish and Wildlife Proposed Criteria and also for the National Marine Fisheries fish passage requirement for salmon. And then in the last row, there is work done by us and others on the velocity requirements for migrating juvenile salmonids.

Q Are those numbers in the juvenile salmonids column in the Washington WAC?

A **No, they are not.**

Q **Can a culvert that's designed to pass a six-inch trout pass juvenile salmon some of the time?**

A **Well, you could specifically design a culvert to meet juvenile passage requirements for a given period of time, let's say 90 percent of the time. You could do that. It is onerous, but you could do that.**

Q **I'll turn to the next slide. Would you please explain what this slide depicts?**

A **So this is one of the ways in which we would use the hydraulic method. It is for the design of baffles as a retrofit to an existing culvert. So if for some reason we plan on replacing this culvert in the future, but at this point, for whatever reason, it's not being replaced, we can achieve some level of fish passage inside this culvert by fitting it with these steel plates, which increase the roughness inside the culvert, the resistance to flow, and they also increase the water depth to provide greater depth for the fish to swim through.**

The reason that we use the hydraulic method, this velocity method here, is because unless we have criteria to design these things to, we're adrift. We don't know how close to put these together, how tall to make them. We need to have some criteria to design them to, so we have a velocity or fish swimming ability criteria.

There's also a second criteria, which I haven't mentioned up

until this point, which is not in WAC. But in our study of fish passage, we found that as you increase roughness, thereby decreasing velocity, you increase turbulence. So turbulence is the velocities that are not -- that aren't directly downstream. In other words, they're to the left, they're up and down. They create turbulent cells with the tumbling of the water. This is turbulence.

So as we increase roughness, we increase turbulence. And at some point, we create turbulent cells that are large enough that they prevent fish from swimming through them. They're tumbled back out of the culvert. So we have these two conflicting values. One is velocity and the other is turbulence.

As we increase roughness, we increase velocity and we increase turbulence. So we manage the conditions inside the culvert using these two criteria. And what happens actually is that as you increase slope, which increases the velocity, then we increase roughness, we get more turbulence. So it effectively limits the slope of a hydraulically designed culvert, let's say in the case of baffles. For baffles, we don't apply them to any greater slope than three and a half percent.

Q This particular photograph of this west fork Hylebos Creek culvert, did you take that photograph?

A I did.

THE COURT: Counsel, before we leave that, if I could ask him a question about that one.

Mr. Barnard, the baffles don't go all the way across the inside of the culvert?

THE WITNESS: They don't.

THE COURT: Does that increase the velocity in the area that is not baffled? Do you understand me?

THE WITNESS: Yes, I do.

In some cases, we actually bring the baffle all the way to the other wall. It depends on what the low-flow discharge is. So if we have a stream which pretty much dries up during the summer, we run those baffles all the way across so that we can maintain as much depth inside the culvert as possible.

As that base flow, we call it, increases, then we provide more of a notch on that side and we're able to keep flow depth deep, but then we have a swim-through condition; whereas if we have the baffles, then we force fish to jump over that. And at low-flow conditions, that can be difficult for them. So we have a swim-through condition on that left-hand side there. So we have enough flow that we can keep that full, right, so there's enough depth for the fish to swim through it, but we also have the roughness created by the baffles to decrease the velocity.

There's also the issue of transporting sediment, too, because these streams have transported sediment. The fact that they're angled downstream this way and they have that notch, the conditions are balanced so that we get a maximum set of transport so the thing doesn't fill up with sediment and reduce the

effectiveness of the baffle.

THE COURT: Thank you.

By Ms. Woods:

Q Let's move on to stream simulation.

A Ah, it's such a relief to get to stream simulation.

Q And why is that?

A Because it's a preferred method.

Q Did you design the stream simulation method?

A I developed it in Washington State.

So the concept behind stream simulation is that if a fish can successfully navigate a natural channel, and if we create conditions inside the culvert which are similar to those in the natural channel, by implication we get fish passage. This is very important, and we don't take this casually.

If we can't recreate conditions that are like the natural channel inside the culvert, it is not stream simulation. We don't call it stream simulation. So there's a number of criteria that we have for this method. One of them I'm just going to get to right away is called slope ratio. And it is the ratio of the culvert bed slope to the upstream channel slope. And we say that this ratio can't be any greater than 1.25. What that means is that the slope of the culvert can't be 25 -- more than 25 percent greater than the upstream channel.

Let's say the upstream channel is a 1 percent sandbed channel or a small gravel bed channel, but because of site specific

conditions, we need to oversteepen the culvert, let's say to 5 percent. So if conditions inside the culvert are 5 percent, it's going to be a boulder bed stream, and it won't look anything like the upstream channel. That's not stream simulation, so the method will not apply in that particular case.

The other aspects of the stream simulation culvert are that the bed material inside the culvert be similar to that found in the adjacent channel; that the culvert is deeply countersunk, 30 to 50 percent. The reason for this is that we want to have a substantial amount of bed material inside the culvert to allow for vertical variation in the streambed.

And the third or last one is that the channel -- the width of the culvert is greater than channel width. In this particular case for confined channels, the width of the culvert, the width of the bed of the culvert, is 1.2 times the bankful width of the stream plus two feet.

And I can explain where that came from if you want to know, but I won't go there. It's almost lunchtime.

This is an end view looking up at the outlet of a stream simulation culvert, one of the first ones. This was taken a long time ago. It's in the Chehalis River basin. I believe it's a Weyerhaeuser culvert. And there's supposed to be another line in here. I'm going to try draw again. This might be a mistake.

There needs to be another line in here so we have kind of a defined streambed inside of there that looks something like this,

and that this is the bankful width of this stream. It's like a nine-year-old's drawing this stuff. You don't preserve this, do you?

But that's the bankful width of the stream inside the culvert. You see we have dry banks inside the culvert and that the culvert sides are substantially wider than the stream.

Q This particular culvert, have you used it in any of your studies?

A No, I did not.

Q How about this one?

A This is Club Creek. It was originally constructed by Weyerhaeuser. It's in the White River Tree Farm in, I guess that would be Pierce County. And this is a stream simulation culvert. The width of this is 1.2 plus 2, so it's exactly what our stream simulation method says.

You can see that it has a channel that runs down the middle of the culvert; that there are dry banks at this low-flow condition; that the flow is generally isolated, from a hydraulic standpoint, the majority of the time, except during peak events, and that this culvert is part of my stream simulation -- oh, the part of the first one but not the second one, unfortunately. And I have looked in depth at this culvert.

Q Are there situations where the stream simulation design method would not work?

A Yeah. I just mentioned one, which is where the culvert must

be oversteepened relative to the upstream channel. So if we can't create conditions inside the culvert that don't look like the adjacent stream channel, we don't do stream simulation.

THE COURT: Counsel, let's go ahead and take our lunch break at this point in time.

(At this time, a lunch break was taken.)

THE COURT: Welcome back from lunch. Are you ready to start the afternoon session?

Counsel, you were on direct.

MS. WOODS: Thank you, your Honor.

By Ms. Woods:

Q Mr. Barnard, before lunch, we looked at the three design methods for designing culverts. Can you tell just by looking at a culvert what design method was used?

A Actually not.

Q Is it possible that if one person designs a culvert using the no-slope method and someone else designs a culvert using the stream simulation method, you could wind up with two culverts that look the same?

A Yes.

Q Is it possible that if one person designs a culvert using the hydraulic method and someone else designs a culvert using the stream simulation method, you could wind up with two culverts that look the same?

A Yes. And in fact, the roughened channel method, which uses

the hydraulic criteria, actually, it's seeking a similar goal to stream simulation. The only way you would be able to tell the difference would be to measure the culvert bed slope with respect to the upstream channel slope.

Q Is it possible that if one person designs a culvert using the no-slope method and someone else designs a culvert using the hydraulic method, you could wind up with two culverts that look the same?

A Yes. But you know, you can tell the difference -- no, you couldn't tell the difference.

Q In the studies that you've conducted, have you included hydraulically designed culverts in the sample?

A Actually, there is one roughened channel culvert that is included in my current stream simulation study.

Q In your studies, have you measured water velocity inside a culvert?

A Well, I both measured velocity at the time of our site visit, and then I also modeled velocity in measured cross-sections.

Q Can water velocity vary for different cross-sections inside a culvert?

A Inside the culvert, it can, particularly inside -- or within a stream channel. In my reference reaches, there are two cross-sections within the reference reach which is approximately the same length as the culvert, and it's not uncommon to have a 20 percent difference in velocity between the two cross-sections.

Q **And by "reference reach," are you referring to the channel outside the culvert?**

A **Yes.**

Q **At the outset of your testimony, I believe you said you'd been with Washington Department of Fish and Wildlife for almost 14 years; is that right?**

A **Yes.**

Q **During this time, have you observed any changes in the types of culvert designs that state agencies have installed?**

A **Yes. When I first started working for Fish and Wildlife in '95, there was no stream simulation method. There was the no-slope design method and the hydraulic design method. These are the only two ways that a person could design a culvert.**

We realized that neither of these methods applied, particularly to higher-gradient streams, and so I developed the stream simulation method to expand our methods so that they applied to any channel. So anyway, the progress has been from these two -- the two methods that were outlined in the Washington Administrative Code to expand to the use of the stream simulation culvert. So we've gone from the no-slope used to be the default method to now the stream simulation is the default method, or the method that is used -- looked at first in the alternative analysis.

Q **We spent quite a bit of time describing the three methods for designing culverts. Why do we need multiple methods for**

designing culverts?

A Well, the first engineering code of ethics says that we are to use our knowledge and skill for the enhancement of human welfare and the environment. What this sets up is a balancing act between human welfare and environment. A hundred years ago, that balance looked a little different than it does now, where the human welfare was quite a bit more important than the environment, and we created culverts that passed water safely from one side to the other.

And then of course as we began to see the fact that culverts also interfere significantly with our natural resources, we began to design culverts that had greater environmental benefit, particularly passing fish, so we're bringing that balance more into alignment.

And as we realize that need for ecological connectivity between the upstream and the downstream section of the stream, we developed stream simulation which brought that more into alignment.

Human welfare just doesn't mean cost. We don't just do these methods just because one is cheaper than the other. There's a lot of other issues, particularly property rights. Often adjacent landowners forbid our access to their land. So if we have an inside stream channel where the upstream channel is discontinuous from the downstream channel and we need to connect these two and we can't get access to land outside of

right-of-way, we need to create a structure which connects those two in order to provide fish passage.

So we need a method for us to do that, and it's not stream simulation because we would have to oversteepen. As I talked about the slope ratio, we have to oversteepen it, so we can't use stream simulation. We need another method to do that, to get from one side to the other.

There's other instances where adjacent landowners refuse to have any access to their land because they don't believe that the State should waste all that money on that big culvert. And let me tell you, this isn't just some idle observation. I mean, this is regularly the sort of interaction that we have sometimes with landowners. It's also a case where -- a recent project in Thurston County, where an undersized culvert in a road at peak events diverts water along a ditch line, where it reconnects with the channel much further downstream. Well, what this has done is it's caused the downstream channel to narrow as a result of not having these flushing flows. And then the downstream channel -- or downstream landowner has a very insufficiently designed culvert in his driveway.

So the County's claim is if we put in a full- sized culvert now, we let all the peak flow go through here, then we're going to flood the downstream neighbor, and we'll have a deleterious effect on that downstream neighbor and clearly going to overwhelm his culvert, which has been serving him for only as much water

that makes it through this existing culvert.

So here, clearly by changing the culvert in this particular instance, we have an effect on a downstream landowner, you know, which is outside our control. So we need a method to approach this situation. And if it's just stream simulation, we're lost. I mean, what do you do there? You put in a stream simulation culvert, and then the County is sued, or it could easily be a state highway, because this also occurs on state highways. So now the County's getting sued because they've had a deleterious effect on a downstream landowner.

I don't think that this balance is something to take lightly. I work for the Department of Fish and Wildlife. You know, I'd love to see valley-spanning structures all over the state, but clearly we wouldn't have a modern transportation system if all we did is drive on bridges. So you know, we have to keep this human welfare and environment in a balance, because we clearly can't do all one or all of another.

Does that answer your question?

Q Yes. Thank you.

MS. WOODS: Your Honor, one of the slides that was in Mr. Barnard's presentation was a slide from AT-128. In the pretrial order, we had an objection to that exhibit. We are withdrawing that objection. In fact, we'd like to offer AT-128 for admission into the record.

MR. STAY: We refuse to let her withdraw the objection.

THE COURT: AT-128 will be admitted.

MS. WOODS: Thank you, your Honor. That concludes the direct examination.

THE COURT: Cross-examination.

MR. STAY: Thank you, your Honor.

CROSS-EXAMINATION

By Mr. Stay:

Q Hello, Mr. Barnard. How are you today?

A Perfect. I couldn't be better.

Q You could be better, you say?

A Couldn't be better.

Q Great.

My cross may be a bit disjointed as I try to put in comment to what you said and also talk about what I've just done. But I was curious about your last comment. You're talking about this balance. And this balance, you do it, the Department of Transportation does it, and they balance all these interests trying to figure out what culvert solution might be better.

Is that what you were saying?

A Basically.

Q Okay. And sometimes the balance would be for a larger culvert that might pass fish and sometimes the balance might be for a smaller one because of other circumstances.

A Yeah. I'm not talking about the average culvert installation. I'm talking about fairly rare circumstances, but

they still do occur.
Q Okay. I think I want to start with where you ended, because I really enjoyed that.
Mr. Barnard, you would agree with me that the stream simulation culvert design method is the preferred method today in the Department of Transportation in the state of Washington?
A I don't know about the state of Washington -- I mean in the Department of Transportation. But in terms of our design philosophy, the stream simulation method is preferred.
Q When you say "ours," you're talking about the Department of Fish and Wildlife?
A Yes.
Q Okay. And you provide guidance to the Department of Transportation as they select their particular culvert designs?
A Insofar as we provide guidance to anyone.
Q So your role with the Department of Transportation is no different than your role would be in providing a guidance to me if I want to ask how I could fix a culvert on my property?
A Actually, I have two relationships with the Department of Transportation. One is I am what's called a scoping engineer, which I think Mike Barber told you about, so I do provide conceptual-level designs for the Department of Transportation. But I also, of course, review their projects as they come up, some before HPAs.
Q I want to see if I captured your discussion on the stream

simulation. I want to sort of give you a hypothetical which I think is consistent with what your testimony was.

Let's assume for the moment that a hydraulic culvert design culvert and a stream simulation design culvert, and no-slope and stream simulation, all three could go into a particular location. It was possible. Okay?

Now, they both would meet their relative standards. In that case, would you agree with me that the stream simulation culvert would be the preferred culvert for passing fish?

A You said "they both." You mean three methods?

Q Yes. I said no-slope, stream simulation, and hydraulic, both -- all three can be installed in a particular location.

So my question to you is: In that situation, would the stream simulation be the culvert design that would be best for passing fish?

A Yeah, depending on what the site-specific circumstances are.

Q No. They all work. That's my hypothetical.

The stream simulation would pass more life stages than the hydraulic, I assume. Am I correct?

A Well, what I talked about in the hydraulic design method is we use an adult fish criteria, but that doesn't mean that juvenile fish couldn't pass through that structure.

Q That wasn't quite my question. Let me see if I can state it again.

Would a stream simulation culvert, as compared to a hydraulic

design culvert, be able to pass more salmon at more life stages and more flows than would a hydraulic method?

A Yeah, although I'm going to equivocate on this. Considering that I have a hydraulic culvert in my mind which has many of the characteristics of a stream simulation culvert, so it isn't as clear a line as that.

Q So they're all the same?

A No, they are not all the same, but it's not a -- you know, I don't think I can make any dramatic, earth-rending, you know, distinction.

Q It looks like a culvert with Moses striking the water. So it's not possible for you to say that a stream simulation culvert, because it's larger, because it exceeds the bankful, would be more likely to pass juvenile salmon than will a hydraulic culvert design?

A Let's make it easy. Stream simulation, generally speaking, is preferred for location.

Q It's better for passing wood?

A Generally speaking.

Q And debris, other debris?

A Generally speaking.

Q Sediment?

A Generally speaking, yes.

Q That was nice to make it easier, wasn't it?

A Yeah. We could have gone on all day otherwise.

Q **Mr. Barnard, you're not a biologist. Am I correct?**
A **That's right.**
Q **You are an engineer. Have you taken any classes in biology since you took your degree in engineering?**
A **No, although my daily interaction is with biologists, and regularly on stream surveys with biologists.**
Q **So you consult with biologists regularly?**
A **Yes, every day.**
Q **But you don't have a degree in biology?**
A **I don't have a degree in biology.**
Q **Would it be fair to say that if you had a biological question that came up in the design of a culvert that you would consult with a biologist?**
A **No.**
Q **You would make the biological determination yourself?**
A **Well, generally speaking, we look at physical characteristics. We don't actually measure fish. We don't count fish. We look at physical characteristics.**
Q **So that it's possible as you're designing culverts to go through the whole process and not even talk to a biologist?**
A **Right.**
Q **Okay.**
A **That's what these design principles are. They're engineering principles.**
Q **So using these engineering principles, so not talking about**

the biologists, you're able to make these designs as you think are appropriate?

A Yes.

Q Do you agree with me that under Washington State requirements that culverts are required to pass free -- or to freely pass fish? Is that a requirement under state law, as you understand it?

A We could read what it says in the RC -- are you talking about the RCW?

Q Yes.

A It says that every dam or structure must be fitted with a durable and efficient fishway, I believe are the words.

Q To freely pass fish?

A It doesn't say that.

Q Doesn't say that?

A Does it? I forget now.

Q No. I don't mean to trap you. Actually, I'll tell you what you can do. Why don't you look at Exhibit H, Slide 3.

A Yes. That's what I was looking for.

Q We have no secrets.

A "Dam or obstruction action cross a stream" -- "A dam or other obstruction across or in a stream shall be provided with a durable and efficient fishway approved by the director and shall be maintained in an effective condition to freely pass fish."

You're right. Sorry.

Q **I knew I was.**

There's also a hydraulic code that you rely on; is that right, Mr. Barnard?

A **Yes.**

Q **And that's in the Washington Administrative Code?**

A **That's right.**

Q **And why don't you go to Slide 4. Is that your sort of guideline in how you're developing culverts? This is sort of your basic understanding; this is the rules you follow here in the WAC? This is what controls what you do?**

A **Well, actually what we do is, these are rules; they're not an engineering design method. So what we have done is we've interpreted these rules in our guidance, which is what we're now calling the culvert manual.**

So I don't actually sit and look at the WAC when I'm designing a culvert. I would look to the culvert manual, since it is an engineering document.

Q **Since we have the WAC out, just look at it for just a moment. It says, "Culverts shall be designed so as not to impede fish passage."**

A **That's right.**

Q **So that would be something you would follow. That would be one of the rules you would follow?**

A **Actually, the name of our culvert manual is "Design of Road Culverts for Fish Passage."**

Q **So looking at the WAC and looking at the RCW, one says to not impede fish, and the other says to pass fish.**

Does that, in your mind, as you'd interpret it, only apply to adults, adult fish?

A **Well, no. Actually the RCW has been interpreted to mean all fish.**

Q **And that would be juveniles?**

A **Sure.**

Q **Now, I looked at -- since you have the WAC still up. Looking at that, I'm looking at there's a no-slope option, a hydraulic option.**

Are those, as I understand them, are they two culvert design methods?

A **Well, as we're looking at the WAC, we see that there are a set of -- there was a rule associated with two methods. Now, they're actually not called no-slope and hydraulic.**

Q **It says "no-slope." That's why I used those words.**

A **Yeah, I know, but they were in quotation marks. I mean, that doesn't say that in the WAC. Right?**

Q **Oh, I see. Okay, because this is your slide. Thank you.**

A **So in the WAC, it gives a series of criteria for the design of a culvert, right? No-slope, we call it.**

Q **Okay. So you gave me sort of a lay person's view of what those longer words in the WAC would mean?**

A **It's common parlance.**

Q **Okay. I'm a common guy.**

I see that stream simulation is not listed.

A **That's exactly right.**

Q **So stream simulation, I assume, then, is not listed in the WAC?**

A **It's not in the WAC.**

Q **So it's not something that you can require someone to do?**

A **It is not something we can require someone to do.**

Q **You can't require the Department of Transportation to do it?**

A **No, we couldn't.**

Well, you know, that's not exactly true.

Q **I'll just sit down here.**

Go ahead, Mr. Barnard. The judge wants to hear your answer.

A **Okay. That's not exactly true because we say in the WAC that we - I forget the exact words for this - that we must mitigate so as to cause a no-net-loss in the productive capacity of the stream. In that sense, if we can show that using another -- that using stream simulation results in a no-net-loss of productive capacity, then in that sense we could require the use of the stream simulation method.**

Q **That's different. Do you remember taking -- I took many depositions of you over the last four or five years, but we took one in --**

A **Just two.**

Q **Two. That's right.**

A They were so long.
Q You did not have a rebuttal deposition. That's true. In 2006, we did that.
At that time, do you recall indicating to me that the manual, which were in the stream simulation design method, as set out is advisory?
A It's guideline, yes.
Q It's guidelines. Okay.
A Was that at odds with what I just said?
Q No. No, no. If it was, I --
A I was just wondering why you commented.
Q You did fine.
On the no-slope design, do you agree that the no- slope culvert design method was initially designed to help small landowners install culverts without expensive engineering?
A Well, actually, the WAC doesn't tell us what they designed it for. We have interpreted it as the method which is available to people who do not -- who would want to do this without the assistance of an engineer.
Q Do it by themselves; sort of home project kind of thing?
A DIY, or whatever it is.
Q The no-slope design standard, would you agree with me that it sets up a few basic relationships but it really doesn't talk about fish passage, it doesn't really address the issue fish passage in the design itself?

A **No, it doesn't. It sets up physical and hydraulic relationships which we believe provide fish passage.**

Q **I think I have some easy questions for you now. Do you agree that the hydraulic method is no longer the preferred method?**

A **It's not the preferred method.**

Q **Do you agree that in many cases, the hydraulic method is not even allowed?**

A **In many cases, the hydraulic method is not even allowed. It says that right in the culvert manual.**

Q **Do you agree that the hydraulic method applies to temporary retrofits within existing culverts?**

A **That and exceptional circumstances.**

Q **And the exceptional circumstance is where you have a new culvert built to a hydraulic standard?**

A **Yes.**

Q **And that would be rare?**

A **Rare.**

Q **So we basically need to have a really good reason for doing that?**

A **We would have a really good reason for doing that. We wouldn't do it cavalierly.**

Q **Now, a hydraulic design, the design itself is based on a velocity. Am I correct?**

A **The hydraulic design?**

Q **Yes.**

A **It's based on velocity, minimum depth, and energy dissipation factor.**

Q **It has a design flow. Am I correct on that as well?**

A **Yes, 10 percent of exceedance flow.**

Q **And that design flow, that's greater than one foot per second. Am I correct?**

A **No. Design flow would be a discharge.**

Q **A discharge. And what would that be?**

A **Well, a discharge would not be exceeded more than 10 percent of the time.**

Q **Is there a discharge amount?**

A **Well, it would depend on the stream and where you were.**

Q **I see. So a hydraulic method, it's my understanding -- and I could be wrong on this. It's my understanding that the hydraulic method has a velocity standard of four feet per second in its design. Am I incorrect on that?**

A **Well, for culverts between 10 and 100 feet, the adult trout velocity criteria is four feet per second.**

Q **And that's what the hydraulic culvert is designed to, to pass that fish?**

A **Yes.**

Q **Am I correct -- even though you're not a biologist, I think you may know this. Am I correct that a juvenile salmon will not be able to migrate through velocities that high?**

A **Well, we have data on the swimming ability of juvenile salmon**

in bare culverts. That means culverts that have no bed material inside of them, or flume studies that don't have any bed material inside of them. But culverts which have substrate, in other words, they have gravel, let's say, or streambed material in them, the passage characteristics are probably different than they are in a culvert without.

Q Again, I just don't know this. I need to ask you.

I thought that the juvenile salmonid passage criteria that you've identified in your slideshow is one foot per second and that that was considerably slower than the six-inch trout.

Am I reading that incorrectly?

A No. You're reading that very correctly. But it also depends on what flow you are measuring that velocity.

Q So it's possible, in your mind, that a juvenile salmon will be able to migrate upstream in flows reaching four feet per second?

A If there's bed material inside the culvert -- because actually we don't know because the studies for swimming ability, at least up to this point, have been done in culverts without any bed material inside of them.

We know that in a bare culvert, there's a barrier, it -- well, Pat Powers did his - I can't see it on the screen now - 1.2, 1.3 feet per second. He found that in bare culverts.

We actually did further studies in the culvert test bed facility looking at the passage of juvenile Coho in baffled

culverts. There were surprisingly strong velocities they were able to swim against.

Q Even though your exhibit that you provided us has swimming abilities or velocities of 1.1, 1.3, 2 and 1, it's your testimony here that indeed juvenile salmon can migrate at speeds -- at flows up to and over -- up to four feet per second?

A Well, no. What you're seeing here are all values that are related to passage of fish in bare culverts or in flumes, and so they actually are on the same footing.

In a bare culvert, four feet per second, I'd very much doubt that a juvenile salmon would be able to migrate through that. But in a culvert which has a bed in it, in the case of a roughened channel culvert, they may be fully able to at least hold at that four feet per second.

Q And that's your biological opinion?

A No. Speculation.

Q Speculation?

A Speculation.

Q Thank you.

Was one of the reasons why you embark on, and this is your method of stream simulation method, embarked on this challenge to create a new method was that the old traditional methods only dealt with one life stage, adults, and did not really adequately deal with juveniles? Is that one of the reasons you took on that?

A **Well, actually, the main reason was to provide passage for fish in higher-gradient channels. That's the main reason. What we really were trying to address was the passage of fish, particularly resident fish in headwater streams. That was the original impetus.**

Q **So you would not agree with the statement that one of the purposes was, with the existing technologies or methods, that upstream adult salmon in traditional methods consider only one life phase, a complex organism, and then in fact, there was a need for additional methods, and this was one of the reasons for the stream simulation?**

A **I know that. I wrote that.**

Q **You agree with that?**

A **Yes.**

THE COURT: I've written things I don't agree with.

MR. STAY: Your Honor, my goodness.

THE WITNESS: But I do agree with it. But you know, if you ask me why I originally did it, I did it at the request of the biologists working in enforcement.

By Mr. Stay:

Q **Do you recognize this, Mr. Barnard?**

A **I do.**

Q **It is from your slideshow?**

A **Yes.**

Q **It is a hydraulic culvert which has baffles in it?**

A **Yes.**

Q **Now, when you use baffles, is one of the problems in using baffles that it creates increased maintenance issues?**

A **That is true, yes.**

Q **So you would want to make sure that you had those baffles maintained regularly?**

A **Yeah, particularly the inlet to the culvert, because at least in this particular case -- in fact, I have a slide in my slideshow, in case you want to look at it, which shows someone maintaining the inlet to this very culvert.**

Yeah. It's -- I don't know what those numbers mean. It's this one, the same culvert. This guy is maintaining the inlet to that same culvert in the slide here.

Q **Is the use of baffles basically a method of retrofitting?**

A **Retrofitting. But the culvert we're looking at right here, this was a new culvert that's had baffles inside it.**

Q **And it's a hydraulic culvert, so I must assume, then, that there were some exceptional reasons for allowing this particular culvert here?**

A **Yeah. This is Dickerson Creek. It's under the Navy's railroad for the white train, the one that carries the nuclear materials to Bangor. They said, you're not going to dig up our train track, so we had to jack pipe through. That's trenchless technology there.**

Q **So I suspect that one example of exceptional circumstances**

would be a nuclear arsenal and the need to get weapons to it?

A That was it. It doesn't happen very often.

Q This culvert won't be relative to my next question. When you're retrofitting -- when you retrofit a culvert, are you intending that culvert will ultimately be corrected?

A Our recommendation for baffles are that they be temporary projects.

Q Is there any guidance in your documents on how -- what "temporary" means?

A Unfortunately, no.

Q Temporary could be permanent, if it's not watched closely, I assume?

A It would be unfortunate, but I guess that's possible.

Q That is certainly not what the State would want, or at least the Department of Fisheries would want?

A We would not want that.

Q Now, you indicate that hydraulic method, in your opinion anyway, needs to be done in rare cases, exceptional circumstances. Retrofits should be temporary.

Am I recalling your testimony correctly?

A Yeah. So that would be one way that we'd use the hydraulic method. Another way might be the design of such a thing as a roughened channel.

Q As a roughened channel?

A Which would be a permanent structure.

Q Would that be a retrofit or would that be a new culvert?
A That would be a new culvert.
Q Is it possible under the WAC, as you understand how it's administered, that hydraulic culverts can be used by other parties for new culverts? Without putting others, you could recommend that they not use it and they could say to you, I'm sorry, we're going to use it anyway?
A It's rare, but there are some times -- you know, I can't think of any -- you know, people call me all the time and say, why can't I do the hydraulic method, because it's available in the WAC.

I can't remember a case in which someone actually has designed a -- let's say a more traditional hydraulically designed culvert. It's truly rare.

Q And with respect to wood, I understand from your slideshow --

MR. STAY: Your Honor, what I'm putting on here are slides from his slideshow, which is exhibit H to his declaration, which has been admitted into evidence.

By Mr. Stay:
Q Mr. Barnard, this sort of gives us a feeling for how important wood can be to the, if I might use the word, survivability of a culvert?
A Yes.
Q And it says that wood debris can have a significant impact on a culvert. In fact, it looks like it is the most dangerous

in-stream factor that can be used to effect a culvert?

A And when combined with sediment, accounts for three-quarters of the failures in this particular study.

Q And a failure, I suspect, can have rather serious consequences for the river itself?

A These were road failures.

Q And that would affect the river if there was a road failure, would that move sediment and wood down?

A It potentially could be disastrous.

Q When we look at the three culvert designs we've been talking about, hydraulic, no-slope and stream simulation, of the three, would you agree that stream simulation is most likely not to be affected by wood?

A I want to make this easy, and I'm going to say yes, although there's a bunch of reasons why I could qualify that.

Q I like your easy answer.

A It's two o'clock.

Q I want to understand no-slope and stream simulation. Let's lay aside for a moment hydraulic.

Is it true that if the circumstances in the river would allow the construction of a no-slope culvert, a stream-simulation culvert could also be built there as well?

A Yes.

Q And the difference between a no-slope and a stream simulation, at least in terms of their size -- I understand you

want to make that stream simulate the outside of the stream when you're doing the culvert. But in terms of their size, would it be fair to say that a stream simulation culvert would, in the main, be wider than a no-slope culvert?

A Are you talking about the span or the width of the bed?

Q The width of the culvert. The culvert would, as I understand the formula, would create a culvert slightly wider than the bankful width with respect to a stream simulation. Is that true?

A Yes, although that may not be true in terms of the culvert span. But we will make it simple, and I'll say yes.

Q Good. I appreciate your help on that.

My question goes one more, though. If I'm going to install both of those and I'm going to have to dig a hole to put it in, and I put a coffer dam up so the water doesn't come through when I'm working on it, and I've got to buy flaggers, and I've got to buy -- whatever I have to buy to make this happen, there really isn't much difference in the cost between a stream simulation and a no-slope when you decide to install one or the other?

A In a public works project like you'd find on a public road, the cost of the culvert is relatively small compared to the overall project costs. Now, on a forest road, that is not the case any longer.

Q In terms of Department of Transportation, which have public work highway kinds of projects?

A That's exactly right. The guardrail probably costs more than

the culvert does.

Q **Thank you.**

A **I shouldn't have said that.**

Q **I think I understand. It's relatively small.**

A **Yeah. There are all these other elements into these things which are very costly, and traffic control being one of them.**

Q **You developed stream simulation when it wasn't there before?**

A **Right.**

Q **Is it fair to say that culvert design methodology, science, is evolving?**

A **Yeah.**

Q **And you would expect, then, that some day, sooner or later, somebody might have an improvement to stream simulation?**

A **They might.**

Q **It may be you?**

A **It may be me.**

Q **I understand you're doing some studies right now?**

A **That's right.**

Q **So that applying some sort of an adaptive management or continuing to look at the process would make sense from a scientific point of view?**

A **Well, if my experience with the forest and fish adaptive management program is any example, I would say no.**

Q **Let's leave forest and fish out for a moment and just look at the concept of continuing to look at the science that exists**

today to see whether or not we can improve it tomorrow.

From a scientific point of view, is that a good thing?

A Yeah. Yeah. We should be doing research. We should be developing -- continuing to develop this as a method.

Q Have I put up a slide of a stream simulation culvert?

A Yes.

Q Good. It wasn't labeled that way. I want to make sure I've got it right.

What I wanted to bring your attention to was the low velocity margin. When you're developing a culvert that's slightly larger than the bankful width, this sort of low- margin area, that's designed to assist fish in higher flows?

A No. This would be for lower flows.

Q Lower flows. Okay. So if you have low flows, there's still water for them?

A Well, no. Low velocity margin is an area of velocity and low turbulence. It's recognized as a passage pathway not only for small fish but also for amphibians.

Q Now, the stream simulation culvert, which is supposed to -- I don't want you to sort of mimic it or -- I don't know if that's the right word, but sort of simulate the outside culvert, you want the culvert inside to sort of look like the culvert -- I mean the bed inside to look like the bed outside?

A That is the basic principle of stream simulation.

Q And the bed outside has these kind of meanders and these kind

of low-flow margins, and you have them here?

A Yes.

Q And that fish sort of adapt to their streams? I mean, they adapt to how the streams operate. Am I right on that?

A Well, there are migration strategies to how they're going to utilize the materials.

Q So when you have a stream inside a culvert that looks like a stream outside a culvert, it's going to make it easier for those fish to migrate?

A That's the principle.

Q In your slideshow, you had a number of slides that sort of showed us hypothetically various culvert designs, and I just want to put them on to identify. This would be a hydraulic -- sort of an example of how a hydraulic culvert design would appear in this stream?

A Actually, if you put the previous slide up, then you can kind of see the sort of perspective that you're going to get through this sequence.

Q I'll try to do that. I don't have it with me, but Wendy, who is the smartest person in this world --

MR. MONSON: Page 14 of Exhibit H.

MR. STAY: Page 14. Thank you.

THE WITNESS: I don't know if I should --

By Mr. Stay:

Q This shows us the --

A I was actually talking about the ones before this one.

Q We should ask you how far you want us to go back.

A I'm sorry. I didn't look. I forgot that there was this one. But there's one before that gives you this sort of whole overview picture and then -- that's it.

Q Okay. As I look at this, it tells me sort of like -- am I correct that this is sort of like the benefits of the various --

A Ecological benefits are on the vertical scale, and then on the horizontal scale would be the crossing structure with the approximate cost.

Q So if I look at hydraulic, it would be narrower, and it would have less ecological benefits than would stream simulation?

A That's right.

Q Okay. So let's go to the slide after this. This is the stream now, right?

A Yes. If we're going to define the elements here, we show a bankful channel, and then 100-year floodplain. This is a relatively unconfined channel. This is actually a pretty big one, too.

This would give you a true impression of what the effect is to fill the floodplain and to prevent flow.

Q It's illustrative. I mean, you know, no one's building this?

A This is actually not in the case area, by the way.

Q That's okay.

A This is in eastern Washington.

Q That's okay. The river works.

So we're back again now to the first example, which is -- identifies a hydraulic designed culvert.

A So we're low down in the lower left-hand corner of that benefit cost.

Q And it has -- it passes flood flows and allows passage of certain fish at certain flows and many undesirable -- with many undesirable ecological effects?

A Yes.

Q Moving along the continuum, we have this -- am I correct, this would be a no-slope?

A Or a culvert, which is channel width.

Q Oh, channel width. Okay.

I have a question for you. One of my colleagues asked this. Channel width, bankful width, ordinary high water, are they, for our purposes, relatively synonymous?

A For your purposes, they are the same.

Q Thank you.

Now, this is our no-slope, and we see that the culvert is now slightly larger?

A Um-hum.

Q Passing water underneath. And we know that this passes flood flows and debris, allows passage of most fish, allows some stream processes. And the last slides I want to show you --

A Actually, there's two more slides.

Q **Did I take it away too soon?**

A **No. There are two more slides. There's this one, which shows stream simulation, and then the final one that shows --**

Q **So this is our stream simulation culvert. It passes flood flows and debris. It allows passage of nearly all fish and aquatic organism and allows many stream processes, including banks?**

A **Yes.**

MR. STAY: Now, I'm not going to show, your Honor, the bridge one, unless you care to see it, because we're not asking for bridges. But I can do that if you wish.

THE COURT: No. That's fine. It looks like a bridge to me.

THE WITNESS: Well, it's not. I mean, it's still a culvert. The bridge one, of course, would span the whole 100-year floodplain, in which case we would have, as I was talking about earlier, you know, we would maximize ecological benefits with respect to human needs.

MR. STAY: Let me just look a little bit at my notes. I think I'm done. Thank you very much, sir.

THE WITNESS: Yeah, so that -- you know you were looking at --

By Mr. Stay:

Q **I guess I'm not done okay.**

A **-- sort of the extreme case for each one of those design**

methods.

Q Right. I put it as more of illustrative. I didn't --

A Yeah. What we're showing is this continuum, just on the basis of width, between the smallest, least expensive, but having the greatest ecological effects, to one which has the greatest benefit, showing that continuum.

MR. STAY: And again, a second time, thank you very much.

I have nothing further, your Honor. Mr. Monson has a few questions.

MR. MONSON: Thank you, your Honor.

RECROSS-EXAMINATION

By Mr. Monson:

Q Mr. Barnard, I'm Peter Monson. You last saw me probably on a little black box on a speaker phone at your deposition. It's a pleasure to meet you in person.

I just have a very few questions. I can't help but comment that your enthusiasm for the stream simulation method is very infectious.

A Well, one of the federal agencies, the Forest Service, has written an absolutely stunning guidance manual on stream simulation.

Q Well, thank you. You just answered my next question. I appreciate that.

A I was one of the major reviewers for that guidance manual.

Q **Excellent.**

And the Forest Service has a slightly different technical approach, does it not?

A **Oh, that. Well, we're headed to the same place. We're headed to simulating natural stream conditions inside the culvert. We're both going to the same place, but they get there with a level of rigor which is way beyond what we require.**

Q **That's good to know. Thank you.**

Now, the National Marine Fisheries Service has also indicated a preference for the stream simulation methodology, right?

A **Yes.**

Q **And they have an approach that's also ended towards the same goal. They calculate the --**

A **It's headed towards the same goal, although they use -- I want to remember this correctly. They use a simple factor to relate the bankful channel width to the culvert bed width. I believe it's 1.3.**

Q **From a fish's perspective, it probably looks about the same?**

A **Well, actually, one of the problems with it -- do you want to know what the problems with it are? Do you want me to go into this?**

Q **I don't really want to get into too much detail. I wasn't really looking. I was just wanting to make a point that they have developed similar methodology.**

A **They have a criteria as well.**

Q **Thank you. Now, in your declaration, you have attached a copy of the Anadromous Salmonid Passage Facility Design Manual, which the National Marine Fisheries Service published in 2008.**

A **Yes.**

Q **That would be Exhibit W-089-D. The part you included was just certain excerpts, certain pages excerpted from that document, correct?**

A **Yes. I believe it related to that criteria we just spoke about.**

Q **I'd like to ask you a couple of questions about two pages that you didn't include in your excerpts.**

MR. MONSON: So I would ask, Madam Clerk, if you could hand the witness USA Exhibit 198.

By Mr. Monson:

Q **Do you have that in front of you?**

A **Yes.**

Q **And is that the complete document from which you excerpted those pages?**

A **It looks like it.**

Q **Would you turn to Page 67, please.**

A **Yes.**

Q **Do you have that in front of you?**

A **Um-hum.**

Q **That's beginning under 7.1, "Introduction." It might be easiest if I just read the first three sentences for you, and I'm**

just going to ask you if agree with those statements.

A Um-hum.

Q It begins, "This section provides criteria and guidelines for the design of stream crossings to aid upstream and downstream movement of anadromous salmonids. For the purpose of fish passage, the distinction between bridge, culvert, and low-water crossing is not as important as the effect the structure has on the form and function of the stream."

Do you agree with that sentence?

A Yes.

Q Continuing on. "To this end, these criteria conceptually apply to bridges and low water crossings as well as to culverts. In addition to providing fish passage, any road crossing design should include consideration for maintaining the ecological function of the stream, passing woody debris, flood flows, sediments, and other species that may be present at the site."

Do you agree with that last sentence?

A Yeah. Um-hum.

Q Turning to Page 68, do you see the bulleted items there?

A Yes, in the middle of the page.

Q And the sentence reads -- introduces those bullets. "The following alternatives and structure types are listed in general order of NMFS's reference." And that would be the National Marine Fisheries Service.

And then the first one there is "Road abandonment and

reclamation or road realignment to avoid crossing the stream. The second one would be bridge or stream simulation spanning the stream floodplain, and so on. I won't read all the details.

The third alternative type is an embedded pipe culvert, bottomless arch design, or non-floodplain spanning stream simulation.

Do you see that?

A Yeah. I think they mean more of the -- kind of the no-slope idea.

Q The fourth one would be hydraulic design method.

A Um-hum.

Q The fifth one would be constructing an external fishway adjacent to a culvert, I guess?

A Um-hum.

Q And the last one would be a baffle culvert or internal weir.

Do you see that?

A I do.

Q Do you agree generally with these priorities?

A Yeah.

Q Okay. Thank you.

Now, the Federal Highway Administration has prepared a synthesis report entitled, "Design for Fish Passage at Roadway Stream Crossings: Synthesis Report," which was published in 2007.

Are you familiar with that document?

A I am. They actually now have a draft design guideline for

fish passage and culverts called -- I think it's called HEC 26. I just read a final draft of it a couple of weeks ago.

Q Does the Federal Highway Administration also indicate a preference for stream simulation culverts?

A Well, actually, the draft I read of HEC 26, they recommend a culvert design method based on sediment stability.

It was very disappointing. I read the initial draft of this. They are adamant. It's sort of an engineering-based design. It is kind of like -- it's basically kind of a velocity sort of design based on sediment stability.

Q From a fish passage perspective, you still continue to believe that stream simulation is the best?

A Oh, yeah.

MR. MONSON: I have no further questions. Thank you.

THE COURT: Any redirect, Ms. Woods?

MS. WOODS: No redirect, your Honor.

THE COURT: Mr. Barnard, before you step down. I appreciate your enthusiasm for all this as well. Thank you. I have a question that may not make a lot of sense. Maybe it's my lack of understanding here.

THE WITNESS: It's a complicated business.

THE COURT: I assume that most of the streams that we're talking about that have these barriers drain into either Puget Sound or the Pacific Ocean, correct?

THE WITNESS: You're talking about the case area?

THE COURT: Yes.

THE WITNESS: Yeah. I don't know too much about the case area.

THE COURT: All right.

THE WITNESS: I'll take your word for it.

THE COURT: The streams, being dynamic things, other than seasonal variation in terms of flooding, etcetera, lots of rain, do we ever have to worry about the stream actually getting smaller or bigger over time? I guess what I'm asking is, if you put in a stream simulation culvert, can it become obsolete because the waterway gets bigger?

THE WITNESS: Well, there's a couple of instances where this would be true. One would be urbanization, so increased surface area and then increased discharge. So it's possible that the stream would become bigger because of that.

There's also stream incision, which means that the bed of the stream actually is going down. Actually, all of our streams are incising. We have sort of a young geology. So I would characterize it as young geology is erosion. So basically our landscape is going down through the action of water and sediment, and so streams are incising. They're going down continually. So we countersink stream simulation culverts deeply so that we have a margin there for that downward variation.

But if it goes down far enough, we're going to encounter the bottom of the culvert, and then it's all over. Then it's

obsolete. Another case, too, would be where a person didn't accurately understand where in its evolution a stream is. And let's say the stream is incised, so it's rapidly dropped down in vertical elevation. This ends up with a very narrow, deep channel. What happens over time is that channel starts to widen out and develop a floodplain.

So if you measure channel width at some point within that progress, within that evolution of that channel, you get it wrong, right, if you didn't understand it was getting wider, in which case, then, the culvert would be too small for that stream channel, according to the criteria.

So these are some instances. You know, actually we could probably go into this all day.

Am I kind of getting at your question?

THE COURT: Yes. Thank you. You may step down.

You may call your next witness.

MR. SHAFTEL: The State calls Allison Hanson to the stand.

THE COURT: Ms. Hanson, if I could have you raise your right hand and be sworn, please.

Whereupon,

ALLISON HANSON

Called as a witness, having been first duly sworn, was examined and testified as follows:

THE CLERK: Please state your full name and spell your

last name for our court reporter.

THE WITNESS: Allison Hanson, H-A-N-S-O-N.

MR. SHAFTEL: Before we begin, your Honor, I believe we reached an agreement on the majority of the exhibits that the State will be using during the course of Ms. Hanson's testimony.

The remaining exhibits that are attached to Ms. Hanson's declaration that have not been admitted are 093-H, 093-I, 093-K, 093-O, 093-N. Sorry. I went out of order. 093-P, 093-Q. In addition to the ones that have been attached to our declaration, the State is offering -- will be utilizing the following -- or anticipates offering the following exhibits: W-145, W-150, W-151, W-157, W-158, W-159, W-160, and W-191.

From that list, I'll give the clerk a list of the exhibits that have been stipulated to. Those would be 093-H, 093-I, 093-K, 093-N, 093-O, 093-P, 093-Q, 157, 158. So I believe we have five remaining exhibits outstanding.

Actually, 145, the State will withdraw that exhibit. And the State will withdraw 160 with the condition that 191 be admitted. So again, it's a conditional withdrawal.

And another preliminary point, Ms. Hanson is both a direct testimony witness as well as a rebuttal witness. We've done our best to try and merge the two into a single presentation, but it probably will run longer than the typical allotted time for a direct testimony witness. I mentioned that to opposing counsel, and I don't know how much agreement we have.

MR. STAY: We have no objection as long as it's within the trial period.

THE COURT: All right. Mr. Shaftel, give me a minute to catch up on the exhibits that have been stipulated to here.

Mr. Stay, the State is requesting -- asking to withdraw one of the exhibits so long as there's no objection to W-191, which is a map of south Lake Washington vicinity.

Do the plaintiffs have any objection to 191?

MR. STAY: Yes, your Honor. The problem is they're both the same map. The 191 has an overlay of data that I view then as a compilation of data. We've never seen that. I don't know where it came from. I don't know whether it's complete or not.

We don't object to the map coming in, although we couldn't find it. It looks like Lake Washington, so we'll accept that. I'm not trying to be smart, your Honor. We just didn't find it in our data base.

So 160, south Lake Washington, we would not object to that. We don't think it's appropriate to have an exhibit with an overlay of data where the underlying data has not been provided.

MR. SHAFTEL: Your Honor, that particular exhibit is a printout from a GIS workbench, which is something that Mr. Stay actually questioned Ms. Hanson on in her deposition. She has merely obtained a printout from this particular data source for the Department of Transportation for the purposes of just providing the Court an example of the types of information that

can be overlain on a map when the Department of Transportation is assessing the fish passage culverts that are within a highway corridor -- I'm sorry, in a highway improvement project corridor, and that's the sole reason for which it's being offered.

MR. STAY: You Honor, if it's not being offered for the truth or falsity of the data laid on it, I don't have an objection.

THE COURT: So then we'll go ahead and allow them to withdraw 160. And Madam Clerk, W-191 will be admitted.

Thank you, Counsel. You may inquire.

DIRECT EXAMINATION

By Mr. Shaftel:

Q Good afternoon, Ms. Hanson.

A Good afternoon.

Q Could you provide your full name for the record?

A Allison Hanson.

Q What's your current title with the Department of Transportation?

A Director of environmental services for mega projects.

Q And can you provide the Court with a brief overview of your education?

A I have a Bachelor of Arts in environmental studies and have a degree in education, K through 8.

Q And how did you end up coming to work for the Department of Transportation?

A **I had a three-month internship in the hazardous materials program out of the headquarters office in Olympia.**

Q **And when did that begin?**

A **That began in 1998.**

Q **And have you been working for the department ever since?**

A **Yes.**

Q **Can you describe the progression of your career, again, in a broad sense, from that period of time to your current position?**

A **I worked in the hazardous materials program for about five years in our headquarters office, and then I was promoted to be the project environmental manager for the Alaskan Way Viaduct and seawall replacement program in Seattle. And in that role, I was responsible for ensuring that the project obtained all the environmental clearances.**

I was in that project for a little over a year when I was promoted to be the project environmental manager for the I-405 corridor over on the east side of Lake Washington. In that role, I was responsible for ensuring that the projects - at that time, we had, I think between ten and 11 active projects on the I-405 corridor - that all of those projects obtained the environmental clearances that they needed.

I was in that role for about two years when I was promoted to be the deputy director of environmental services for the urban corridor's office, which at the time was the region overseeing the mega projects within Seattle, so the Alaskan Way Viaduct

program, the 520 program, the I-405 program, projects on 167, and some smaller projects in the Seattle area. And in that role, I provided assistance to the project teams to help them with management and guidance on environmental clearances for their projects, as well as provided a conduit to our state environmental management out of the headquarters office.

And I was in that role for a little over a year when I was promoted to become the director of environmental services for the region, which is the position that I'm in today. In my current position as a director, I provide environmental management support to all the project offices and staff that work within my region on environmental clearance issues.

Q What do you mean when you say "environmental clearance"?

A For all of the projects that we have, there are specific environmental requirements that we need to meet, which include meeting the requirements of NEPA and SEPA and Section 106, which relates to protection of archeological and historic resources, Section 4F, which relates to the protection of public places and historic structures, Endangered Species Act consultation, as well as all local, state, and federal permitting requirements.

Q You also have responsibilities with regard to tribal outreach?

A Yes, I do.

Q And what are those?

A Currently I'm the tribal coordinator for my region, which

entails primarily being the watch dog representative that oversees tribal coordination between the projects and the different tribes that we consult with.

Q And do you also have responsibilities with regard to performing mitigation on highway improvement projects?

A Yes, I do.

Q And can you go into a little bit of those responsibilities?

A Related to mitigation?

Q Yes.

A Related to mitigation, there may be different types of mitigation that we may do for projects, which include stream mitigation, wetland mitigation, other types of mitigation from impacts that occur during construction of projects.

Q How many employees do you supervise?

A I directly supervise six state employees, and I have 19 state employees that work within my team, and then I have consultants that report to me as well.

Q Did you prepare a Declaration in Lieu of Direct Testimony for this case?

A I did.

MR. SHAFTEL: Madam Clerk, could you hand the witness W-093?

By Mr. Shaftel:

Q Take a moment to review Exhibit W-093, Ms. Hanson, and tell me whether or not that's the declaration that you prepared for

this sub-proceeding.

A It is.

Q And do you adopt that declaration as your testimony in this sub-proceeding?

A Yes.

MR. SHAFTEL: Your Honor, I'd like to offer into evidence Exhibit W-093.

THE COURT: Any objection?

MR. STAY: Yes, your Honor. We have objection to two parts of that; one part dealing with the Highway 305 project and the other dealing with -- the last section dealing with culvert design.

My suggestion would be that during my cross-examination, I intended to ask her questions, and then I'd like to raise the objection then and you can rule at that time.

THE COURT: That makes sense. We'll reserve.

By Mr. Shaftel:

Q Ms. Hanson, what is the first step that the Department of Transportation takes when it is building -- let me just step back.

What are some examples of the types of highway improvement projects that you work on and the purposes that they're looking to achieve?

A Typically the projects that I am working on are safety, mobility projects, and they may include projects where we're

adding lanes, for example, to I-405 or replacing the Alaska Way Viaduct, doing widening along the SR-520 corridor. We may also be making safety improvements as well as for other projects.

Q And what's the first step the department takes when it's working on one of these projects to identify potential barriers that may need to be corrected during the course of one of these projects?

MR. STAY: Objection, your Honor. I don't think this witness is qualified to talk about how you identify barriers, what's involved in it at all.

She testified that's she's basically an environmental coordinator for these projects. A hefty job, but not one that involved the identification of culverts.

THE COURT: Let's have a little more foundation, Mr. Shaftel.

By Mr. Shaftel:

Q Ms. Hanson, are you involved, in your work, in helping to identify potential barriers along the corridors that may need to be corrected during highway improvement projects?

A I am. I've worked on the I-405 corridor, for example, previously, where during the time that I was the project environmental manager, I participated with my team in developing the lists of barriers that were within our project areas. I've also participated with the 520 team and the 167 team, with technical staff and engineering staff as they're compiling

information on existing barriers within our project areas.

Q And are you aware of the data that's available to the Department of Transportation to try and determine whether or not there's barriers within the scope of a highway improvement project?

A I'm aware of some of the types of information technical staff use.

Q And what are some of those types?

A There is information that's available through a GIS workbench that is an agency tool that we have. That workbench is managed by a GIS team out of our headquarters office in Olympia, and that GIS workbench has multiple GIS layers on it which contains different types of information from other state or public agencies with essentially their latest and greatest most up-to-date information on resources.

And those layers can include things such as information on streams as well as built environment, above-ground type of information as well. That's one example of information.

Q If you'll turn your attention to your monitor there. Could you describe what you see on this monitor?

A This is an example of a printout looking at our GIS workbench.

Q You are talking about Exhibit W-191; is that correct?

A Yes.

Q There's a number of different colored fish-looking symbols on

here; is that correct?
A Correct.
Q And what are those supposed to represent?
A Those fish represent different types of status of barriers within the project corridor -- or sorry, different types of status of culverts within the project corridor.
Q And do you know where the department obtains that information from?
A I believe it comes from the Fish Passage Inventory.
Q On the legend there that explains what the different colors stand for; is that what that is?
A That's correct.
Q What's the other layer that is shown on this particular exhibit?
A The other layer is one that is from DNR that lists the different types of stream typing per WAC 222-166.
Q And what do you mean by "stream typing"?
A Stream typing essentially gives you an indication about characteristics of that stream, so whether it may be fish bearing, non fish bearing, a shoreline of the state.
Q And how does the Department of Transportation use this information?
A Technical staff can pull up these layers, for example, in the GIS workbench, to obtain existing documentation about resources and environmental considerations within the project area.

Q **Ms. Hanson, before you, do you have copies of exhibits W-093-D through W-093-G?**

A **Was the first one B as in "boy"?**

Q **D as in "dog."**

A **Yes, I do.**

Q **Why did you attach those exhibits to your declaration?**

A **They are copies of past and current MOUs or MOAs between DOT and the Department of Fish and Wildlife, and in some cases other agencies, regarding HPAs and barriers.**

Q **Can you go through each one of them and just tell the Court which different MOA, MOUs are attached?**

A **Yes. W-093-D is an MOU that was created in 1990 between the department and Fish and Wildlife and primarily talked about the process for acquiring an HPA.**

W-093-E is an MOU between multiple different parties that, again, talks about the HPA process, and related to barrier culverts in particular notes that if there's a barrier culvert within the capital improvement project, that that barrier culvert would be corrected during the time that that capital improvement project went forward.

W-093-F is a 2002 MOA between the Department of Fish and Wildlife and Washington State DOT. It includes also information about the HPA process and applications specifically related to highway improvement projects and fish passage barriers. It notes that if during the course of a highway improvement project we are

altering or modifying a barrier culvert that we are required to replace that culvert with a fish passable structure.

And W-093-G is the 2008 MOA between Fish and Wildlife and DOT. This is the current version of the MOA that projects refer to now. And in this particular MOA, there is a section that specifically talks about culverts being fixed during the course of safety and mobility projects.

Q You mentioned the term HPA several times. What is an HPA?

A An HPA is a hydraulic project approval, which is a permit that is issued to DOT construction projects when we have projects that occur within waters of the state.

Q And where do you apply for an HPA from?

A The Department of Fish and Wildlife.

THE COURT: Counsel, let's go ahead and take our afternoon recess.

(At this time, a short break was taken.)

THE COURT: And you may inquire.

By Mr. Shaftel:

Q I would like you to turn to the monitor, Ms. Hanson. Do you recognize the page from Exhibit W-093-G on the monitor?

A Yes.

Q And what is this page?

A This is the page from the 2008 MOA between WSDOT and Fish and Wildlife that talks about culvert replacement that occurs through highway mobility projects.

Q **The highlighted portion under the fourth bullet, what does that refer to?**

A **That refers to if a transportation project is doing work on a barrier that requires an HPA from Fish and Wildlife, that DOT is required to replace that barrier with a fish-passable structure.**

Q **And is that the section of the 2008 MOA that the Department of Transportation looks to when trying to determine whether or not it's required to fix a barrier during the course of a highway improvement project?**

A **Yes, it is, as well as two other subsections of that same section.**

Q **Which two subsections are you referring to?**

A **The two bullets below the highlighted bullet.**

Q **And can you explain to the Court how you use those two subsections?**

A **Yeah. The second bullet up from the bottom talks about that highway improvement projects that may have a culvert barrier within the project but that WSDOT is not doing any actual work on that culvert itself. So if there's no HPA required for work on that culvert, WSDOT could choose to fix that barrier on a case-by-case basis.**

The last bullet in that section talks about in rare cases when WSDOT is doing work on a barrier, if there is extraordinarily high cost and minimal gain, WSDOT could choose to do some other type of mitigation in lieu of replacing that

structure with a fish-passable crossing. And if we were to do that, we would be required to provide mitigation to compensate for that.

Q Now, in your declaration, you provide two different project examples for which the Department of Transportation fixed barriers within the scope of the highway improvement project; is that correct?

A Yes.

Q And one of them was SR 900?

A Correct.

Q And do you have -- and the other one was a project in the Olympic region; is that correct?

A Correct.

Q And that is summarized in Paragraphs 20 through 24 of your declaration?

A Correct.

Q Why did you include that Olympic region project in your declaration?

MR. STAY: Object, your Honor. I believe this witness has no direct experience in the Olympic region. She's been with the urban corridors, which I do not believe is in the Olympic region. Therefore what she's testifying to is purely what she has been told.

MR. SHAFTEL: Your Honor --

THE COURT: That's all right. The objection will be

overruled.

The question is actually: Why did you include that Olympic region project in the declaration?

THE WITNESS: The reason that I included it in is because it's an example of how WSDOT replaces fish passage barriers within a highway improvement project.

By Mr. Shaftel:

Q And how did you learn about the information that's expressed in Paragraphs 20 through 24?

A I had discussions with Jeff Sawyer, who's the regional environmental manager for Olympic region, so he's essentially my counterpart within that region. I also reviewed documentation that was provided by Jeff's office, which included environmental assessments for the project, portions of hydraulic reports, written correspondence between WSDOT and the Suquamish Tribe, which included e-mails and letters, and other project documentation, and then I went out on site in Poulsbo to look at the replacement culverts.

Q So let me see if I understand this. You initially obtained information from Jeff Sawyer, who is who?

A Jeff Sawyer is the regional environmental manager for Olympic region, so essentially my counterpart in that region.

Q So he would have been the person that directly worked on the Poulsbo project?

A Jeff and his team, yes.

Q **And then to confirm the information that Mr. Sawyer provided, you also looked at public documents?**

A **Correct.**

Q **And these are documents from the project file?**

A **Correct.**

Q **And did those documents confirm the substance of the information as reflected in Paragraphs 20 through 24?**

A **Yes, it did.**

Q **And when you went out and you visited the sites, did you have anybody accompanying you?**

A **Yes, I did.**

Q **Who accompanied you on those visits?**

A **Paul Wagner from WSDOT, John Peterson from WSDOT, Scott Anderson from WSDOT, and Don Seeberger from WSDOT.**

Q **And who are those four people?**

A **Don Seeberger is technical services manager on my team. Paul Wagner is biology program manager for WSDOT. Scott Anderson, I'm not -- I probably can't say his specific title, but he oversees retrofit programs out of headquarters. And John Peterson works on the fish passage program.**

Q **And what did you see when you went out in your site visits onto the Poulsbo project?**

A **We looked at the culverts that are in place now underneath Highway 305 and 307 and saw what they look like today in their existing condition.**

Q **And what did you see when you were out at these projects?**

MR. STAY: Objection, your Honor. If the witness is going to testify to the quality of the culverts, the nature of the mitigation, the nature of the design, she's not qualified.

Perhaps I could interject, too, this is an area we had objected to, this section, SR 305, and the paragraphs which follow. I can raise the -- continue with my objection now. I was letting Mr. Shaftel go on because I assumed he was trying to lay foundation and the Court would need to know that. I think the foundation has not been properly laid to have her discuss any of this project.

Mr. Sawyer is the appropriate witness. The State did not see fit to have an important enough issue to bring Mr. Sawyer here. This witness went out and talked with him. She went out and looked at the records. She's not a biologist. She's not an engineer. She can't tell us what she saw in terms of whether the culverts are good or bad, whether they're passing or not passing fish. We would renew our objection. This section, SR 305, Part A, should be stricken from the exhibit and not considered by the Court.

MR. SHAFTEL: Your Honor, this is the State's witness, who's an expert on highway improvement projects. She's the State's representative on that topic. She's went out and she's confirmed using public documents, all the information that's reflected in Paragraphs 20 through 24. She's actually visualized

the site. The only purpose for which we're even offering this testimony is to give the Court an example of a highway improvement project and how the State has worked through that highway improvement project to correct barriers.

I think for that purpose, and under Navel Orange, a Ninth Circuit case, that allows the head of an agency to testify on behalf of research that -- or investigations that were performed by people within the same company. Ms. Hanson's testimony is admissible both as -- the factual testimony is admissible as well as the expert testimony.

MR. STAY: Your Honor, if I might, this witness is not an expert in --

THE COURT: That's all right, Mr. Stay. She doesn't get to testify as an expert in culverts or culvert designs or how they look, but I don't have any problem with her testifying as a factual witness as to what she saw and how it connects with her department and what she did. Okay?

MR. SHAFTEL: Do you have a problem with the paragraphs in which she describes how the department made its decisions about how to -- when it should be in fact correcting some of these barriers, which is what these paragraphs also go to, what she's learned from public documents?

THE COURT: Let me take a look at it, and we can deal with that next time.

By Mr. Shaftel:

Q So Ms. Hanson, when you went out and you inspected the sites, how many sites did you inspect?

A I believe we looked at nine.

Q And of those nine, do you know how many are DOT -- are culverts under DOT roads?

A Six.

Q And the rest of the culverts, what roads do they fall into?

A They're underneath private driveways.

Q Do you recognize Exhibit No. W-093-L, which is on your screen?

A Yes.

Q What does this exhibit show?

A This is a map out of an environmental assessment for the 305 project which shows the locations of the culvert crossings within the project area.

Q So on this map, there's 11 culvert crossings; is that correct?

A Correct.

Q And the culvert crossings that are under state roads would be No. 1, No. 4, No. 5, and No. 10; is that correct?

MR. STAY: Excuse me. Is Mr. Shaftel testifying?

THE COURT: Are you asking her a question, Counsel?

By Mr. Shaftel:

Q Which ones of the Exhibit W-093-O are the ones that were under state highways?

A **I'm sorry. That were under state highways?**

Q **Yes, state highways.**

A **No. 1, No. 2, No. 3, No. 4, No. 5, No. 10, No. 11.**

Q **And did you inspect those sites?**

A **Yes.**

Q **What is this a picture of?**

A **This is a picture of the culvert that is underneath Bond Road.**

Q **And is that one of the state culverts?**

A **Yes.**

Q **Is Bond Road also SR 307?**

A **Yes, I think so.**

Q **And is this picture similar to the condition that you saw it when you were out there?**

A **Essentially, this picture is when the project was still completing construction, so obviously I didn't see it with still the construction elements. But, yes, the structure itself was the same.**

Q **And what is this picture of?**

A **This is a picture of a culvert that was underneath 305.**

Q **And how do the conditions in this picture compare to the conditions that you saw when you inspected the site?**

A **The same as with the last one. Except for the construction aspects of it, the culvert itself looked the same.**

Q **Ms. Hanson, I'd like to ask you about the second bullet point**

on the 2008 MOU, which you referred to -- or I guess it's the third bullet point, which you referred to as the exception to the requirement that the Department of Transportation fix a barrier if it obtains an HPA.

Is that what you said?

A Yes. If there is a -- DOT is modifying or altering a barrier which would require an HPA, the MOA does allow for an exception where WSDOT can provide other mitigation in lieu of providing fish-passable structure at that crossing.

Q In your experience, how frequently does the Department of Transportation invoke this exception?

A In my experience, it is truly the exception. I've seen this on my projects invoke it in one project.

Q And what was that project?

A The triangle project, which is at the intersection of SR 18 and I-5.

Q And can you give some explanation for what occurred at that project?

A Yes. We are doing an improvement project at that intersection. And at that intersection, a tributary to Hylebos Creek crosses underneath I-5 and SR 18 and then heads north up towards SeaTac. And we have four fish passage barriers on that tributary.

Three of those barriers, we're going to have to alter and modify because of the project. And when we were looking at

replacement of those barriers, the upstream habitat doesn't have a perennial water source, and so it's a very flashy system. In the wintertime when there's a heavy storm, it's wet. When there's not a storm, it tends to run dry. And so what we determined was if we replaced those barriers, we'd essentially be getting fish up to a place where the majority of the time there wouldn't be any water for them to go anywhere.

So we worked with the Muckleshoot Tribe initially, and then primarily with the Puyallup Tribe, to talk about invoking the exception and instead of replacing those barriers, doing some other improvements at our mitigation site that would have more benefit to fish.

Q And what types of mitigation were agreed to?

A We have a mitigation site that's located on the west fork of the Hylebos, which at that site, we are going to create off-channel habitat for fish and we're also going to do stream enhancement.

Q Were the tribes involved in that agreement?

A Primarily our involvement was with the Puyallup Tribe on that project.

Q Is this an example of the department working collaboratively with the tribes to reach agreement?

A Yes. We worked with the technical staff from the Puyallup Tribe, who reviewed our mitigation plan and provided us input on those mitigation plans. And we recently signed a mitigation

agreement with the tribe outlining the process that we're going to follow to implement our proposed mitigation.

Q Do you know of examples where the department utilized its discretion under the bullet point immediately following the highlighted section of W-093-G to fix a culvert where it was not actually going to be performing work on that culvert otherwise within the scope of its highway project?

A Yes, I do.

Q Can you provide an example of that for the Court?

A Yes. On SR 167, we have a project we call the Stage IV project. There's two fish passage barriers within that project that we weren't altering or modifying due to the widening project, but we saw an opportunity there to retrofit those two culverts as part of the project, and so we have proposed that, included it in our permitting for the project. Those two retrofits will go forward when that project goes to construction.

We also, on our Kirkland nickel project on I-405, replaced the Forbes Creek culvert, which was not a crossing that we were going to alter or modify due to the widening project. And the 305 project that I talked about earlier, we did a replacement on three barriers that were under private driveways that would not have been otherwise modified or altered by the project.

Q On 167, why did the -- why did you do a retrofit instead of using a full cut-and-cover replacement?

A That project was primarily doing widening into the median.

As I noted earlier, the project wasn't going to modify or alter those culverts. But through the course of doing site work, it was determined that those two barriers could potentially be retrofitted to allow fish passage at those crossings. And from work that we did with Fish and Wildlife, we determined that the type of retrofits that could be possible there would, for the two crossings, come to about $500,000. And we were able to assume that cost within our existing project budget, and so we decided to proceed with including those two retrofits in the project.

Q And had you gone with a full cut-and-cover design on those particular projects, would you have been able to do that discretionary work in the scope of this 167 project?

A No, we would not.

Q What are some of the reasons why the Department of Transportation might not fix barriers within the scope of the highway improvement project that it does not otherwise have plans to work on?

A There could be a multitude of reasons that would be taken into consideration. One of the primary reasons could be fish windows. There are only certain times -- as noted earlier today in previous testimony, there's only certain times within the year that you can do work within the waters of the state, which is typically July 1st through September 30th.

So depending upon the construction timeline that you have, if your overall construction timeline isn't long and therefore is

going over multiple years, you may only have one or two fish windows in which you can do work in the water. And so if you were doing a culvert replacement, depending upon how extensive that work is, that may take the bulk of the fish window, that opportunity that you have for that season.

If in addition to the replacement of the structure you have mitigation associated with that, that as well would likely have to be done within that fish window. So you are limited within the times that you can actually do barrier replacement work. That's one factor, just from a timing standpoint.

Also, taking on barrier replacements in general means that you are obviously obtaining HPA permits. And depending upon the impacts associated with that work, you may have other permits that you then also have to obtain, such as permits from the Corp or permits from local agencies. If you have additional impacts related to replacement of a structure in addition to additional permits, you could also have more mitigation requirements, which could be stream mitigation, wetland mitigation, which would require that you do either mitigation on site or potentially find an off-site location. Depending upon where your project is, finding suitable mitigation can be tougher in more urban areas than it may be in some rural areas. It would also require that you do more excavation work than what would be needed for the widening project itself potentially.

You may also have a need for additional types of construction

equipment to be on site other than what you would normally have. Depending upon the type of construction technique that's used for the culvert replacement, if, for example, let's say, a cut-and-cover, and you would need to have a major traffic shift, that in itself could be a major component of timing, especially if you're talking about a major corridor like 520 or 405, for example, where you can have up to eight, nine lanes of traffic. Trying to plan around doing lane closures can be a major factor.

Q And how can -- how does that adding barrier corrections to a highway improvement project, how can that change the overall scope and focus of the project?

A When I related to you, for example, fish windows, typically your construction project gears around your construction schedule of the major roadway elements of the project. If you had a project that was including multiple barrier replacements, because of the fish window that I talked about earlier, it could be that that work in water starts to drive your overall project in your sequencing, versus the roadway mobility projects driving the overall schedule, could be an example.

Q What are the different mechanisms for tribal involvement in a highway improvement project?

A We have multiple different ways that we work with the tribes on our projects. One way is through environmental document review. So for our projects, we do some type of documentation to comply with NEPA or SEPA. And so at a minimum, the tribes are

given the opportunity to comment during formal comment periods on NEPA and SEPA for the environmental documentation that we have.

In some cases on projects, particularly for EISs, we're able to provide the tribes with the opportunity to review draft discipline reports and documents prior to those documents being published for the public and a formal comment period. So there's that opportunity that we can sometimes provide on projects, even sometimes not for EISs, other projects as scheduled are able to accommodate tribes being provided a review of the draft documents before they're published.

When tribes do comment formally, in projects that I've worked on previously, we've worked hard to work closely with the tribe to try and resolve comments before we finalized those comments. So, for example, if we get 80 comments on an environmental assessment in the past, one example is I've worked with the Muckleshoot tribal staff members to work on what our comment responses would be to those before we finalize our responses.

Another example of tribal involvement is having them participate with us in project meetings, which may be meetings that are focused on specific technical issues, or it may just be regular project update meetings. Depending upon the project and how fast its schedule is moving, those project meetings may happen once or twice a year. They may in some cases, like our 520 project, happen on a monthly or bimonthly basis.

We have had tribes involved with meetings with resource

agencies when we're permitting projects where they're at the table with the resource agencies when we're having permitting discussions. We also consult with tribes on a government-to-government basis, which means we also have meetings which are just with WSDOT and the tribe; in some cases, federal highway administration, where we talk specifically about government-to-government issues or tribal issues that may relate to their usual and accustomed treaty rights.

We also do on-site field reviews with tribes, ask them to come out on site with us and review the existing conditions prior to construction when we're determining our effects and our potential impacts. And then we also have, through the course of projects, the regular type of informal communication with tribes, which may be e-mail or phone or letter correspondence back and forth. And then we also have involvement with tribes in more the long-term planning for WSDOT as well.

Q I'd like you to take a look at Exhibit No. W-150 and Exhibit 151. What is Exhibit No. 150?

A It's a letter from Chris Picard at DOT to Chairperson Williams at the Muckleshoot Tribe regarding a feasibility study that we were doing for a bypass route on 164 -- SR 164.

Q And what is Exhibit 151?

A I'm sorry?

Q Exhibit No. 151.

A Exhibit 161 [sic] is a copy of the 164 Route Development Plan

Corridor Study, the charter for the corridor working group.

Q Have you seen these documents before?

A Yes.

Q And are these documents that the Department of Transportation prepared?

A Yes.

MR. SHAFTEL: Your Honor, I'd like to offer these two exhibits, and the sole purpose for offering these exhibits is just to provide evidence that the Department of Transportation does provide opportunities for tribes to be involved in long-term planning on highway improvement projects.

THE COURT: Any objections?

MR. STAY: Just a short one, your Honor. These letters don't have anything to do with culverts. They have to do with another project entirely. This witness was neither the author nor the recipient of those letters, and therefore I think they're not admissible. They're not relevant, as she has no personal knowledge. They were not under her control, and she was not responsible for the drafting of them.

THE COURT: Mr. Shaftel, given that, I don't see how they'd be very relevant.

By Mr. Shaftel:

Q What existing plans or reference documents do you use in the -- do you use to guide you in conducting your tribal outreach?

A **There are a couple of different guidance documents that we use. One is the agency's Centennial Accord Plan. The Centennial Accord Plan lists out the different divisions, services, and offices of WSDOT and talks about the ways in which those divisions of WSDOT consult with tribes, different ways that we work with them from a planning and funding perspective.**

Another one is our executive order from the director of transportation, and that outlines how DOT employees consult with tribes. It also outlines our tribal liaison office out of headquarters and their responsibilities for consultation.

Q **Let me back up. The Centennial Accord Plan, I want you to turn to Exhibit No. 093-H, which I put on the monitor there. Is that the Centennial Accord Plan that you were referring to?**

A **It is. There's an updated version since 2003.**

Q **When was the updated version drafted?**

A **Earlier this year. 2009, I believe.**

Q **And it has a similar goal and purpose?**

A **Yes, it does.**

Q **And Exhibit W-093 -I, which is now on your monitor, is that the executive order that you were referring to?**

A **It is. And there's also a more recent version of the executive order.**

Q **And when was that published?**

A **I am not positive. I believe it was within the last two years, though.**

Q **And that has a similar directive to the Department of Transportation?**

A **Yes, it does.**

Q **And are there any others that you would refer to?**

A **Yes. There is the NEPA consultation handbook, which was created to inform DOT employees about a couple of different aspects about tribal consultation. One, it outlines the background of how and why we consult with the tribes. It references things like the Centennial Accord Plan and our executive order.**

It also walks through, for employees, the different times at which we consult with the tribes and how we consult with tribes. So, for example, if you were on a project, from an environmental perspective, and you were going to publish an environmental assessment, you could turn to the NEPA handbook and it would walk you through the steps of how you would typically consult with the tribe if you were producing an environmental assessment.

Q **Was this recently created?**

A **Yes, it was.**

Q **Why was it created?**

A **It was created, I believe, to be a guidance document for DOT employees. There had been, I think, a lot of questions going to the tribal liaison office about how to consult and when to consult, especially for the different types of environmental documents that DOT may have related to an eco, which may be an**

EIS or an environmental assessment.

And so the handbook was created at that time by our acting tribal liaison for the agency to help inform employees that are doing environmental work about how and when we consult with tribes. It also has the base premise of doing consultation early and often and really doing a kind of wholesale consultation with the different tribal staff members, which includes both the archeological side, culture resource, as well as the natural resource side.

Q And so is this supposed to encourage DOT employees to provide greater outreach than they would just under the minimum statutory requirements?

A I believe that this does encourage DOT employees to really reach out and make a good effort at consulting with the tribes. It has followup -- frequently asked questions about how to follow up with tribes, and gives ways to follow up and try to gain information. If you're not receiving direct feedback from the tribes, as an example, it gives some steps to be able to continue conversations.

Q Are you familiar with the term "baseline report" as it's used in the scope of highway improvement projects?

A Yes.

Q And how do baseline reports relate to tribal outreach?

A Baseline reports in the context of culverts are something within my region. We have used the graphic as an example, the

cover page, of one for the 167 project. At the time that I came on to I-405, which is when I first started working on projects that had barriers on them, one of the requests that we had heard from tribes, Muckleshoot Tribe staff members in particular, who we worked closest with, asking us to provide information on the barriers that were within our project areas. And so out of that request, through the years, we've created these baseline reports which provide essentially documentation of the existing culverts, both -- all culverts within our project area, so that includes stormwater culverts as well as culverts that have streams, and also provides information on those culverts.

Depending upon the project, the format may be a little bit different on the type of information that's included, but it can include such things as the length, the width of the culvert, the stream that's passing through it, the elevation of the inlet, the elevation of the outlet, what type of upstream habitat there is, how much upstream habitat there is, species that may use that stream, etcetera.

Q And how do you use this information once you have it?

A We use this information -- if we are going to alter or modify a project, we'll use that information to help inform how we go about designing a replacement. We also provide the information that's included within the report in different formats to the tribes, primarily Muckleshoot staff members that we work with closely on our projects, to give them information on the culverts

that are within our project area and information that we have about those culverts.

Q When you say "provide information to the Muckleshoots," do you always provide the entire report?

A Previously on projects, I think in most cases, the entire report has not been provided to the staff members. The information out of the report has been provided in different formats, depending upon the project.

Q And have you always produced these reports when they've been requested from the tribes?

A Yes.

Q Who creates these reports?

A Typically on the projects that I have worked on, it's been consultant staff primarily developing them for us.

Q And how is the scope of work that goes into these reports changed over time?

A In some of the original reports that were from I-405 that were created before I came onto I-405, during the time I was transitioning on, the focus of the baseline report was different. Essentially the focus of that was to look at all the barriers within the project area and for biologists on the team to make recommendations about which of those barrier culverts, from a biological standpoint, would be good candidates for doing replacement.

As we've moved through the years, I've asked the team to have

the baseline reports focus more on the existing data that we know about the culverts and the barriers and provide the type of information we talked about earlier as far as inlet, outlet, upstream habitat, etcetera.

Q Do you know Karen Walter from the Muckleshoot Indian Tribe?

A Yes, I do.

Q And how do you know her?

A I have worked with Karen closely over the last five years on natural resource issues on the projects within my region.

Q How frequently do you interact with Ms. Walter?

A The frequency depends on the projects that we're working on, the particular month, and what's going on with those projects. But I would say in any given month, I'm probably corresponding or in a meeting with Karen probably at least once a month.

Q How much time do you spend responding to Ms. Walter's concerns on highway improvement projects that you work on?

A Can you say it again, sir? I couldn't hear.

Q Yes. Sorry about that.

How much time do you spend responding to Ms. Walter's concerns on highway improvement projects that you work on?

A I think again that depends on the particular projects and what's going on with that project in a month. If we're working on resolving comments on an environmental document, like I talked about earlier, Karen and I have been known to have eight to nine-hour meetings working through comments. In a given month, I

may spend two to three hours being in the same meeting with her or working on some type of correspondence back and forth. So it can be very intensive, depending upon if we're trying to resolve something specific on a project. In other months, it may be not as intensive, but we're just participating in the meetings.

Q Do you have face-to-face meetings with Ms. Walter?

A Yes, I do.

Q How would you say the level of involvement Ms. Walter desires in DOT projects compares to the level that's requested by other tribes?

MR. STAY: Object, your Honor. Speculation on the witness's part.

MR. SHAFTEL: I'm just asking for her experience.

MR. STAY: Yeah. But she's asking her to compare with other tribes.

THE COURT: The objection will be sustained.

By Mr. Shaftel:

Q Do you work with other tribes, Ms. Hanson?

A Yes, I do.

Q Which tribes do you work with?

A I work with the Snoqualmie Tribe, the Suquamish Tribe, the Yakama Tribe, the Puyallup Tribe, the Tulalip Tribe, and then we also work with non-federally recognized Duwamish Tribe.

Q How does your experience with the level of involvement Ms. Walter desires in DOT projects compare to the level requested

by those tribes?

A Related to culvert and natural resource issues, Karen's involvement is greater than what I've seen on projects related to natural resource issues from other tribal staff.

Q In what way is it greater?

A Typically on my projects related to natural resource issues, Karen likes to review documents when they're issued, and she does provide comments. Typically they're substantive, and she has a lot of comments, depending upon the specific project.

She likes to participate in project meetings, technical working groups that we may have, makes herself available to do that in most cases. She will go on site reviews with us in the field, participate in meetings with permit agencies. Those are a couple of the ways that she'll work with us, in addition to regular project meetings, etcetera.

Q When Ms. Walter asked for additional involvement in highway improvement projects, how does the Department of Transportation work to accommodate her?

A Through the years on the projects that I have worked on, there's been lessons learned as we've gone through working with Karen on requests that she's made. One is the example that I provided earlier. When I first started on 405, we weren't providing information on all of the barriers and culverts within project areas.

So in working with my team, we developed baseline reports for

those projects, which include a map that shows all of the culverts within the project area, both stormwater and stream crossings. As an example, we now typically on our projects provide those maps to Karen to show her where all the culvert crossings are. We provide spreadsheets that have, for example, the inlet, the outlet, the upstream habitat, the stream, species, etcetera.

We also work, for example, to try and resolve comments. One of the concerns that I'd heard from Karen when I first started working on 405 was that the Muckleshoot Tribe would provide a lot of comments on a project, and they wouldn't see our responses until they were finalized. And so if they weren't in agreement with our responses at that point they were final, they were on the record, and that kind of left us into a position where we'd have to work to resolve those in the permitting process. It was beneficial to WSDOT and the tribe to not go through that. And so that's when I worked closely with Karen to sit down and go over our draft responses on documents, for example, for some of our projects, so that when the documents were finalized. Karen knew what those comment responses were going to be, which doesn't mean to say that we had 100 percent agreement on every comment response, but it did mean that Karen knew what our responses were before we published them.

Q I'd like you to turn to Exhibit W-155, which is on your screen.

Do you recognize this document?

A Yes, I do.

Q What is this document?

A This is a cover letter for comments that Karen provided to the I-405 team, comments on the Tukwila to Renton environmental assessment, which is an I-405 project.

Q And I will represent to you that the next page is the last page from that exhibit, Page 19.

Do you recognize this page?

A Yes, I do.

Q What is this page?

A This is a copy of a page from our finding of no significant impacts, which is our decision document for the Tukwila to Renton project. And this is showing our responses back to the Muckleshoot tribe on this project was another example where myself and Bill Jordan, the project environmental manager from the I-405 team, worked with Karen to go over our responses on the Muckleshoot comments before we published the documentation.

Q And how many comments did Ms. Walter have on this particular project?

A It looks like 92.

Q And did the Department of Transportation respond to all her comments on this particular project?

A We provided comment responses on all 92, yes.

Q And how does the level of coordination on this particular

project compare with a typical projects in which you've worked with Ms. Walter?

A On an environmental assessment, it can range on our project. But typically I would say there's probably, on our more substantial projects, anywhere between 80 and 100 comments on average that we would see from Karen.

Q How would you describe the Department of Transportation's efforts to reach out to the Muckleshoot Indian Tribe?

A I think that in the experience that I've had on working on projects that we've come a long way from where we were on my projects over the last five years, continued to have lessons learned and worked with Karen to implement changes; have talked about what some of the examples are from ones that I've instituted with the teams. I know that Northwest region, which is another region within the case area, has also been work working on some lessons learned with Karen --

MR. STAY: She's speaking from hearsay, not her personal knowledge, when she's talking about the Northwest region. Unless it is from her own knowledge, there's no foundation for it.

THE COURT: The objection is sustained.

By Mr. Shaftel:

Q I would like to show you -- well, why don't you continue your answer, Ms. Hanson -- let me ask you the question again. How would you describe the department's efforts to reach out to the Muckleshoot Indian Tribe, but this time if you would focus on

your own experiences.

A In addition to the ways that we talked about earlier doing document reviews and providing comment responses on some projects before we finalized documents, when we have requests from Karen to provide documents for her review, which sometimes has happened when we put out SEPA documents, there's reference documents that Karen would like to have, we try to provide those to her as quickly as we can when requested.

In some projects previously, we've been asked for an extension to extend a comment period for the Muckleshoots to be able to provide us comments after the comment period for the project. And I think every case where I've been asked to do that. I have done that and granted the extension. We have also tried to on previous projects that I have worked on, when there's been a couple of projects within my region that all are having a lot of time demands on Karen's time, worked with Karen to try to make an internal decision within WSDOT which of those two projects needs to be the greatest priority so that we can ask Karen to focus her time on one particular project to get through resolution to help decide for Karen what's the best use of her time on a specific project within my region.

I think that in going forward that we'll continue to have lessons learned in ways that we can improve and work with Karen. It is not perfect, but we continue to keep trying to make improvements as we go.

Q **Turn to your screen. And I'm showing you what has been marked as W-157. It is an admitted document.**

Do you recognize this document?

A **I do.**

Q **And what is this document?**

A **This document is an e-mail summary of an update on Northwest region projects in April of this year.**

Q **And is this a document that is provided Ms. Walter on a monthly basis?**

A **That's my understanding, that monthly updates started earlier this year.**

Q **And why were these monthly updates started?**

A **My understanding was that Karen was wanting to have more regular updates from Northwest region about projects that were occurring within the region, and so the regional environmental manager and staff have implemented providing monthly e-mail updates to Karen.**

Q **I'd like you to look at your screen again. I'm showing you W-158.**

Do you recognize this document?

A **Yes, I do.**

Q **And what is this document?**

A **This is a tribal transportation survey that was done to support the data of our transportation 20-year plan.**

Q **Why was this document created?**

A **The document was created to gain feedback from tribes about a myriad of different issues related to transportation that would help to inform the development of the update to the 20-year plan.**

Q **And what is this next slideshow?**

A **This is a table of contents of the different types of categories that the survey asked questions about.**

Q **These are all the different topics on which the tribes were surveyed on?**

A **Correct.**

Q **And this next page, what does this show under "Participating Tribes"?**

A **I'm sorry?**

Q **What is shown under the title "Participating Tribes" about halfway down the page?**

A **My understanding is that that includes the tribes that provided responses back on the survey.**

MR. STAY: Objection, your Honor. She said she's assuming. Does she knows it or does she not know?

MR. SHAFTEL: That's not what she said. She said, It's my understanding.

THE COURT: She said, My understanding is.

MR. STAY: Is that based upon personal information or -- the document says who participated. If she's asked more about what they were doing, she'd have to know what they were doing, the tribes I mean.

THE COURT: You may clarify.

By Mr. Shaftel:

Q Do you have an understanding for what -- for the participating tribes in this survey?

A The participation tribes were tribes that provided responses on the survey.

Q Were the Muckleshoots one of the participating tribes in the survey, to your knowledge?

A Yes.

Q Are you familiar with the term "mitigation" as it's used within the scope of highway improvement projects?

A Yes.

Q What does that term mean to you?

A To me. Mitigation means it is the compensation that is provided after you go through mitigation sequencing on a project. So first you avoid -- look to avoid impacts, and then minimize effects that you're going to have. And then for those effects that remain, you look at how you're going to mitigate for those.

Q And what types of mitigation are typical in a highway improvement project that you work on?

MR. STAY: Your Honor, again, this witness is not qualified to talk about the nature of mitigation, in terms of its impacts and how it's developed biological aspects to it. She is an environmental coordinator, not a biologist, is my understanding.

MR. SHAFTEL: I believe the question I asked were what types of mitigation are provided. She's very experienced with the types of mitigation that are required under her projects.

THE COURT: The objection will be overruled.

Do you understand the question?

THE WITNESS: Yes.

THE COURT: You may answer.

THE WITNESS: We, typically related to natural resources, will provide stream mitigation when we're having impacts within waters of the state. And for the streams mitigation, for example, if we were having a culvert put in that would mean that we're going to have less stream habitat, we would, somewhere else within the project area, potentially do enhancements on stream habitat or create new stream habitat or look for mitigation opportunity off site.

In-stream habitat could include, like I talked about earlier in the case of the triangle project, creating off-channel habitat for fish. It could include doing plantings of native vegetation. It could include adding large woody debris to an existing stream system. We would also typically on projects do wetland mitigation. And wetland mitigation is for impacts to wetlands, depending upon the category of the wetland.

The most pristine wetlands have a higher ratio for mitigation. So depending upon your category, you have certain ratios that you have to meet. We would do wetland mitigation

either, again, within the project area or at an off-site location, which could include doing enhancements of existing wetlands, creating all new wetlands on a site, for example, that's fill, depending upon what your potential mitigation opportunities are within your project area or off site. Those are two -- stream and wetland mitigations are two common resource type mitigation that we provide on my projects.

By Mr. Shaftel:

Q And what permits triggered the mitigation that you just spoke of?

A Permits that we typically obtain on my projects include hydraulic project approvals that we talked about from Fish and Wildlife. We obtain either nationwide or individual 404 permits from the Corps of Engineers. We have 401 permits from the Department of Ecology. We have NPDS permits also from the Department of Ecology for some construction stormwater runoff. Depending upon the local jurisdiction, we may have critical areas review or some other type of local permit that we obtain. Those are some of the most common permits that we get on my projects.

Q Have you reviewed the paragraphs of Ms. Walter's declaration which follow the title "Stream Crossing Impacts and Mitigation"?

A Yes.

Q Have you also reviewed Ms. Walter's deposition testimony on this topic?

A Yes.

Q **And I understand that you were unavailable to actually sit in person on Ms. Walter's in-court testimony due to a personal matter.**

Did you also have an opportunity to review the transcript of the testimony that she provided on 10/14?

A **Yes.**

Q **What is your understanding of the extent of mitigation that Ms. Walter would desire during the course of highway improvement project as compared to what is currently required by regulatory agencies? And I am specifically speaking here about mitigation related to fish-passage barrier improvements.**

MR. STAY: Objection, your Honor. She has no way of knowing what Ms. Walter would think she wants.

MR. SHAFTEL: I'm asking for what's her understanding based upon her review of the testimony that's been provided in this case.

THE COURT: Before we get to that, can you clarify something for me? How is the appropriate amount of mitigation determined? You can't do this, so you're going to do this over here. Who decides how much of this is sufficient?

THE WITNESS: That's usually -- depending upon what the permit is or the resource agency that needs to be involved, if it's wetland mitigation, for example, there are specific ratios that are typically agreed to through regulation.

So in that case, for example, if you had one acre of a

Category 2, there would typically be known ratios for how much wetland mitigation you would need to provide. Then the conversation becomes where do you do that mitigation.

For stream mitigation, it's a little bit trickier because there aren't those defined ratios. So coming up for stream mitigation, typically what you are asked to do is, at a minimum, compensate for the quantity and the quality of what has been impacted, and sometimes even beyond that. And so you'll have discussions with the resource agencies, and in many cases with the tribes who have interest in that area about what appropriate mitigation is for the stream impacts.

THE COURT: The tribe has input into that as well?

THE WITNESS: The tribe can have input into that.

THE COURT: Does it develop into a negotiated process or just more collaborative?

THE WITNESS: I would say it could probably be both of those. I've seen stream mitigation where there can be general agreement on where it is, and there's also times where there is more discussion, and a negotiation about our proposal may not be adequate. And in some cases, for example, on our Renton nickel project, we did stream mitigation. And the proposal that we had, Karen wanted to see some additional plantings and some additional large woody debris added. And so working with Karen's request and with the agencies granting the permits, we came to a resolution on adding plantings and large woody debris as part of

the mitigation.

THE COURT: Thank you.

Now, I forgot your question, Counsel.

MR. SHAFTEL: I'll try to answer it again -- or ask it again, and then answer it.

By Mr. Shaftel:

Q Ms. Hanson, the question that I attempted to pose earlier is what's your understanding of the extent of mitigation that Ms. Walter would like to see on a highway improvement project, specifically with regard to the fish barrier improvement as compared to what's currently required by regulatory agencies?

A From reviewing the testimony, my understanding is that in addition to the direct construction impacts that we would have during construction of the barrier replacement project, that Karen would also be looking for mitigation for potential future effects that could occur from that culvert or fish replacement structure being in place, or other components, of that work activity.

So essentially effects for -- potentially future effects other than the effects that are occurring specifically during construction of that new structure.

Q Can you give an example of how you think that might play out?

MR. STAY: Your Honor, I think it's totally inappropriate for this witness to talk about what Ms. Walter might have been thinking, etcetera. She's testified that she

thinks this is what she meant. What Ms. Walter said is what she said. And Mr. Shaftel can argue about that, but I don't think this witness should be able to interpret on the stand.

MR. SHAFTEL: Ms. Walter is a rebuttal witness in this case. She can come back up and she can clarify what she meant if Ms. Hanson is mischaracterizing it. I'm just trying to --

THE COURT: That's all right. The objection will be overruled.

Based on her understanding, I understand she reviewed the testimony of Ms. Walter.

Go ahead.

By Mr. Shaftel:

Q So I'm just asking for an example to help make this more clear, for how you see this playing out in a real-life circumstance.

A Okay. An example that I could think of maybe to illustrate the concept I'm trying to convey is that if you put -- did a replacement and you put in a new culvert, in addition to mitigating for the direct effects that you would have, that potentially in the future if there was going to be, say a scour condition created at the end of that concrete culvert, that in the context of Karen's testimony, you would be asked to -- the agency would be asked to provide mitigation for that scour condition that would occur in the future at the culvert crossing.

Q So you could have a situation where you have a smaller

culvert that's having larger impacts on the existing habitat, replace it with a larger culvert that's having less impacts on the overall habitat, and you'd have to mitigate for the impact of the larger culvert? Is that what I'm hearing you say?

A If there was a future effect from that larger culvert beyond the construction impacts.

Q All right. How is that different from what's currently required by regulatory jurisdiction that you work with?

A Currently with the agencies that I work with on the projects that I've worked on previously in permitting, the mitigation that we are asked to provide is for those direct effects that happen during construction of the project.

Q And are you aware of any other tribes that you work with that are asking for the type of mitigation that Ms. Walter is asking for?

A No.

Q And has Ms. Walter ever asked for this type of mitigation on a project you're working on?

A I don't believe yet that I have seen Karen ask for that specifically on one of my projects.

Q What concerns do you have about such a mitigation requirement being implemented?

A From a project perspective, and from my experience, the work that we do related to effects of a project is looking at what the direct effects are during construction of a project.

And so from an environmental management standpoint in working with the teams, the question that I would have is how would we do analysis to determine what an unknown future effect of that replacement project could be, and so how would we go about doing that analysis. If there was agreement on how we would do that analysis and it was determined that there would be potentially a future effect, when would the expected requirement for mitigation be expected? Would that be combined with the direct construction effect or would there be an expectation that some kind of monitoring or maintenance check-in would happen in the future. And if that effect came to fruition, then at that point in time, you would mitigate. And if that was the case, would you know in advance what you're expected mitigation would be or would you not have that discussion until the effect was known and then be asked to mitigate? And the concerns that I would have from working on projects is that would potentially leave this outstanding future mitigation concern out related to a project. And how do we plan for that? And how do we pay for that? And whose responsibility, from a WSDOT perspective, does that become if it's a post-construction requirement.

Q Are you familiar with the different design methods available to the Department of Transportation?

A Yes.

Q And what are they, as you understand them to be?

A Stream simulation, hydraulic design, and no-slope.

Q **And when you say "hydraulic," what are you referring to?**

A **Typically my -- the projects that I worked on, hydraulic is related to retrofits.**

Q **And in your experience, does the Department of Transportation make use of all three methods?**

A **Yes.**

Q **Do you feel it's important the Department of Transportation retain discretion regarding design methods during the course of highway improvement projects?**

MR. STAY: Object, your Honor. We've had witnesses today who spoke to this who are experts in the field. This witness is not qualified to talk about which culvert method should be a used in any particular project.

MR. SHAFTEL: Your Honor, if I may --

MR. STAY: This is also beyond the scope of her declaration.

MR. SHAFTEL: It's actually not. It's in her declaration.

THE COURT: All right. The objection will be overruled.

By Mr. Shaftel:

Q **So Ms. Hanson, the question I asked was whether or not you feel it's important for the Department of Transportation to retain discretion regarding the design method implemented during the course of highway improvement projects?**

A **Yes, I do.**

Q **And why is that?**

A **From projects that I have worked on previously, one example is the Thunder Hills Creek project, we had an emergency project. And as part of that emergency project, we replaced the crossing with a structure that was not fish passable, and so we had a requirement to work with the Muckleshoot Tribe to determine whether we could post- emergency replace that with a fish-passable crossing or look at doing a fish crossing within another location in the project area.**

And at that particular crossing, it's along I-405, and it's in the S-curves of 405 within Renton, and so the topography between the northbound lanes and the southbound lanes is a pretty steep difference. Also because of the design, because it's in the S-curves, it has an interesting roadway design consideration. There's also some major overhead and underground utilities that run through the project area. And then we also had constraints of existing right-of-way as well as an existing downstream culvert and concrete flume.

And so when we're looking at the design for a culvert crossing there, we looked at, I think, seven or eight different crossings, which included multiple versions of potential stream sim options.

What we found was through all of those options that we had two major issues. One was in doing a trenchless type of design, the size of the culvert that we would need for the stream

simulation was literally larger than the construction equipment that's usually used to do a trenchless type of technique. So we had a culvert exceeding the typical construction technique capacity.

We also looked at doing a cut-and-cover option there for stream simulation. But because it's on I-405 and because of the roadway design issues, there wasn't a feasible way to do a cut-and-cover without essentially closing all the lanes on I-405 and shifting that traffic to I-5 or to I-90 which, from a traffic standpoint, wasn't going to be feasible either.

So through that process, we worked with Karen Walter and Martin Fox and kind of walked through all those issues, and we then determined that instead of looking at fish-passable crossing at Thunder Hills, we shifted our attention to a culvert that conveys Panther Creek along 167.

And so in that particular example there, after looking at multiple different options for stream simulation, we determined there wasn't a feasible way to do a stream simulation crossing there. That's one reason why I think that there needs to be, from a project perspective, the ability to at least talk about what other design options are, because there may be specific site constraints that don't allow for stream simulation to work, for whatever the particular reason is at that crossing.

That's not to say in every case, but it's to say in some cases there may be site considerations that do come into play.

Another reason why I would say yes to that is the case of the 167 project where, because of the limited budget that was within the project scope to be able to do those two retrofits, retrofits were really the only option that we had within the money that was available.

And so for that project, it was a choice of doing two retrofits to be able to enhance fish passage at those crossings for that project or not doing anything. And obviously, we chose to do the retrofits to be able to do something versus doing nothing. So from a project perspective, I think having those options in the cases where it makes sense, and all of the interested parties, including tribes and the resource agencies, thinks it makes sense to do so. I think it's a good option for projects to be able to have when necessary.

Q Ms. Hanson, how many projects has the Department of Transportation completed during the course of highway improvement projects?

A 153.

Q Are you saying -- is that up to the year 2008 construction season?

A Correct.

Q And how many projects does it have planned for correction in the upcoming ECO projects?

A Upcoming planned projects that we have are on our 520 Eastside HOV project. There's 18 crossings in that project that

we're going to replace. We're going to do ten stream simulation structures. We're also going to be able to just take some culverts out. They're located underneath ramps, and those ramps are going away, and so we'll be able to not have to put any culverts back and essentially daylight the stream there.

For our Tukwila to Renton projects on I-405, we have noted in the EA that there are six culvert crossings that will require in-water work. And so those, we will address for fish passage per the MOA. We have the two retrofits coming up on the 167 project.

Q Are those the retrofits that you just mentioned earlier?

A Yes.

Q With the cost issue being the driver for the retrofit?

A Correct.

Q What's this a picture of?

A This is a picture of one of the existing 520 culverts that we're going to be replacing.

Q And this?

A The same. This is the other end of the 520 culvert.

Q This is a different culvert on that same project?

A Yes.

Q Is this the inlet or outlet, do you know?

A I believe that one is the outlet.

Q Have you been on these sites?

A Yes.

Q **And what is this picture?**

A **This is another 520 culvert.**

Q **And this?**

A **This is a 520 that we're going to replace.**

Q **And you're replacing all those culverts with stream simulation design culverts; is that correct?**

A **Correct.**

Q **And do you know how much cost will be added to that highway improvement project as a result of the installation of the new stream simulation culverts?**

A **The estimate for the replacement structures themselves is approximately $27 million.**

Q **Do you know how much that is per barrier?**

A **Approximately 2.7 million.**

Q **And do you know what's included in that amount?**

MR. STAY: Objection, your Honor. I think she's outside her expertise. It's not part of her understanding. This is not part of her declaration either. She has no explanation or foundation that she has any ability to understand or has any knowledge of how those figures were derived.

MR. SHAFTEL: It is part of her declaration, your Honor. I can point to the specific sections and lay a foundation if necessary.

THE COURT: How much longer do you have?

MR. SHAFTEL: I have about five minutes, your Honor,

maybe less.

THE COURT: I'll overrule it for now. Go ahead.

By Mr. Shaftel:

Q Do you know what's included in those amounts?

A What's included in the cost is just the structure itself.

Q So would traffic control costs be included in that?

MR. STAY: Objection. Leading.

THE COURT: Overruled.

THE WITNESS: Can you ask the question again?

By Mr. Shaftel:

Q Would traffic control costs be included in that amount?

A No.

Q You -- during the course of Ms. Walter's testimony, she said she was unaware of any work that was to be done on barrier culverts on Phase II of the Tukwila to Renton project.

Do you remember reading that testimony?

A Yes.

Q Is that consistent with your understanding?

A No.

Q What's your understanding of what will be done during the Phase II of the Tukwila to Renton project with regard to culvert barrier replacements?

A We noted in the environmental assessment for that project that we had multiple culverts that would require in-water work, which would then trigger the MOA for fish passage.

I think between the time that the environmental assessment was published and the FONSI, which was a decision document, the Thunder Hills Creek emergency project occurred. So I believe if you compare the environmental assessment with the FONSI, there would be one less barrier noted, because at that point the emergency project had happened. So I believe it's six culverts that have in-water work associated with that project. And the comment responses for that project are the ones that we referred to earlier that we reviewed with Karen prior to finalizing them.

Q And so what would that mean if you did in-water work on the Tukwila to Renton project with regard to whether or not you would correct those barriers?

A We did in-water work associated with the culverts that were being modified. And the work triggering HPA, we would be addressing them per the MOA.

Q I'd like to turn your attention to the screen again. Do you recognize this picture?

A Yes.

Q What is this picture?

A It is the Ashley Creek culvert crossing on SR 9.

Q And is this the after condition?

A Yes.

Q And this picture here, do you recognize this picture?

A Yes. It's the west fork of Tibbetts Creek earlier this summer.

Q **This is one of the barriers that was fixed during the highway improvement project on SR 900?**

A **Right. That project is in construction right now, yes.**

Q **And this picture here?**

A **This is on the same project, SR 900, and it's Clay Creek culvert that was put in this year.**

Q **Do you recognize this picture here?**

A **Yes. This is Taylor Creek Bridge crossing on SR 18.**

Q **And is this the before or after condition?**

A **This is after condition.**

Q **And do you know what this bridge replaced?**

A **I believe it was two twin culverts.**

Q **And was this performed during the scope of a highway improvement project?**

A **Yes.**

MR. SHAFTEL: Your Honor, at this time I'd like to admit the declaration of Ms. Hanson, as well as her accompanying exhibits. That's W-093, and Exhibits A through Q.

I believe most of these have already been admitted. I believe with regard to the remaining exhibits, there are no objections.

MR. STAY: No objection to the exhibits attached to the declaration, your Honor. We have two outstanding objections. You may have addressed one. That was the 305 project we talked about earlier.

And our other objection was on Page 20 to Section 7, which sets out a series of stream design determination factors, which I would argue are outside her expertise.

MR. SHAFTEL: Again, your Honor, with regard to Paragraphs 20 through 24, she obtained all that information both through meeting with contemporaries on projects as well as referring to public documents to confirm all the information in those paragraphs. And the paragraphs merely set out the background on the project and set out some information that's actually already been admitted in this case, which is the Department of Transportation fixed its culverts on those highways and that those culverts are still fish passable today.

With regard to Paragraphs 46 through 48, which is another outstanding objection, those paragraphs just summarize what you've already heard from the witness about the situations and site-specific circumstances which may trigger a need to use a design other than stream simulation, and flexibility for having that design that's well within her expertise and her experience.

THE COURT: All right. Mr. Stay, is there any objection to W-093-E?

MR. STAY: That was the memorandum? No, your Honor.

THE COURT: That will be admitted. Then the only other declaration remaining that has not been admitted is W- 093-M. Any objection to that one? Although it's my understanding that's the same exhibit as AT-070.

MR. SHAFTEL: Yes, I believe it is. Well, it's a page from that document, your Honor.

I just wanted to maintain it as an attachment to her declaration for ease of reference for the Court.

MR. STAY: Your Honor, I had suggested to Mr. Shaftel that he may want to use the exhibit that's already in. I have no objection to using the exhibit.

THE COURT: Then for purposes of keeping it all together, we'll go ahead and admit W-093-M, although it's my understanding that is a portion of AT-070 that's already been admitted.

All right. Regarding her actual declaration, W-093, let me read it, and then we can talk about it next time we get together.

And tell me what portions you object to, Mr. Stay.

MR. STAY: Let me get the exact page for you, your Honor. On Page 10, the provision Part A, SR 305, Poulsbo. Again, we argue that's not part of her project. She's not responsible for it. She had nothing do with it. They should have brought the right witness in to do that.

And the next section we object to, the only other one, is on Page 20, Part 7, "Culvert Design Determinations." Those technical items set out are outside of her expertise, and therefore she does not know them. Those are the only two objections to that declaration.

THE COURT: All right. Thank you.

Counsel, this is the end of our trial day. Please remember we will not be in session tomorrow or Thursday. We will be in session again regular time on Friday. How are we doing in terms of schedule?

MR. SLEDD: Your Honor, you may have noticed that Mr. Tomisser and I just slipped out and had a brief conversation about this. We anticipated your question.

It looks to us that we will probably be able to wrap up with the final rebuttal witnesses on Monday, to do closing on Tuesday, unless something untoward happens between now and then.

THE COURT: All right. I thought you guys were discussing a potential settlement.

MR. SLEDD: We were rolling for it.

THE COURT: All right. We'll be at recess. Back in session on Friday morning.

(Adjourned for the day)

CERTIFICATE

I, Barry L. Fanning, Official Court Reporter, do hereby certify that the foregoing transcript is true and correct.

S/Barry L. Fanning

_____
Barry L. Fanning